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ABSTRACT

This monograph was written to answer questions about the essence of librarianship, the meaning of information, and the principles behind a desire for information transfer, preservation of older records, or creation of new ideas. The work is organized into three parts. Part I is titled "In Search of a Discipline: Toward a Science of Library Information (LIS)" and includes chapters 1-4. Part II is titled "Defining Library Reality: Philosophical Inquiry" and includes chapters 5-8. Part III is titled "Metalibrarianship" and includes chapters 9-12. The chapters are as follows: (1) Introduction; (2) Historical Milestones in Librarianship; (3) Changing Paradigms of Library Information Science; (4) The Issue of Library and Information Science Self-Consciousness; (5) Conceptual Framework; (6) What Is Philosophy of Librarianship? (7) Emerging Philosophy of Librarianship; (8) Theories about Knowledge; (9) Intellectual Environment of Metalibrarianship; (10) The Concepts of 'Information' and 'Knowledge' Revisited; (11) Theory of Metalibrarianship; and (12) Metalibrary Implications. A list of the major contributors to the philosophy of librarianship is appended. (Contains 413 references.) (KRN)

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# METALIBRARIANSHIP:

## A MODEL FOR INTELLECTUAL FOUNDATIONS OF LIBRRAY INFORMATION SCIENCE

by

**JOSEPH Z. NITECKI**

1993

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# ACKNOWLEDGMENTS

I acknowledge with gratitude the significant contributions to this work made by my wife, who believed in the project and helped me to complete it, and to my daughter, for reviewing parts of the manuscript.

The prevailing attitude of our library profession to the philosophical issues in librarianship is well illustrated by the attitude of publishing industry. I wrote letters to ten publishers inquiring about the feasibility of publishing a book on philosophy of librarianship. Some publishers did not bother to acknowledge receiving the letter; others, claiming a commercial unprofitability of such a publication, and without even seeing the manuscript, expressed no interest in it.

Hence, I am grateful to Educational Resources Information Center (ERIC) for giving this essay a chance to be read.

INSERT ON THE OPPOSITE PAGE:
Fig. 1-1: Metalibrary Patterns
[For explanation see Fig. 11-11.]

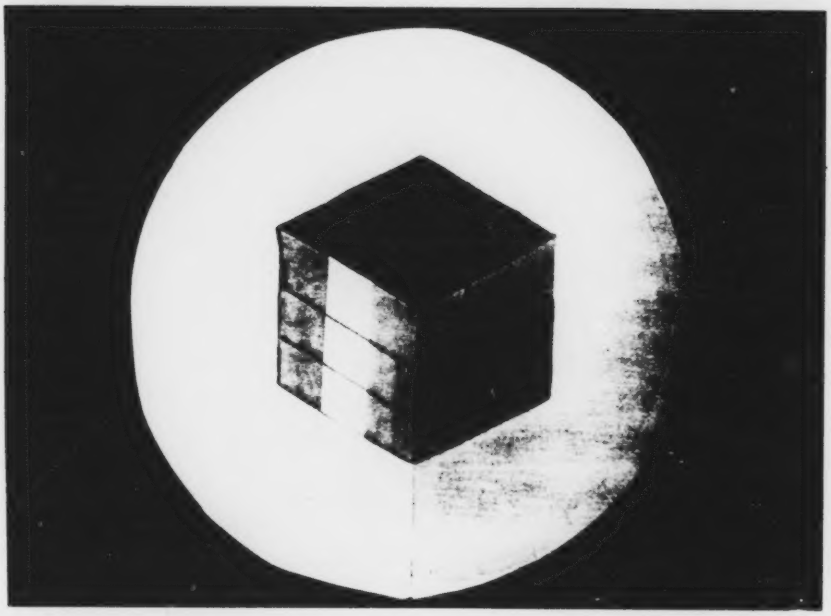

FIG. 1-1: METALIBRARY PATTERNS

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# PART I:
# IN SEARCH OF A DISCIPLINE: Toward a Science of Library Information (LIS)

## CHAPTER 1:
## INTRODUCTION

### 1.1 Prologue

> Make use of old knowledge to impart new.
> Aristotle [1]

No two people and no two communities, even the smallest, are ever the same or unique. Each member of a society and his or her culture are interwoven into their mutually interrelated past and present events and their interpretations.

Our physical existence is defined by a successful perception of, and adjustment to, a constantly changing environment. Our mental growth is determined by the extent of communicating our ideas of perceptions with others. Both physical and mental growth increase with our ability to learn from experiences of others. Communication from the past and into the future is only possible through symbols, standing for nonphysical ideas.

The meanings of ideas are expressed predominantly in recorded formats. The preservation, organization, and dissemination of recorded ideas are essential to our intellectual survival and are the subject matter of librarianship. Their specific content, format, and context are the focus of individual disciplines such as the sciences, the arts, or technology. But the understanding of the ultimate nature of communicating recorded ideas is, I maintain, a domain of the philosophy of librarianship.

## 1.2 The Heritage: An Old Profession

> Cosmic law of evolution starts "from a relatively indefinite, incoherent homogeneity to a relatively definite, coherent heterogeneity."
>
> Herbert Spencer, 1862.[2]

Librarianship is an old profession that only recently emerged as a new branch of learning, a new discipline. Yet, as S. J. Pierce pointed out, the profession is still searching for "a common body of theory shaping the intellectual traditions of the field."[3] Library schools seldom, if ever, offer separate reading courses in the classical works of library theorists; students frown when assigned essays that were published a decade ago, dismissing them as old (irrelevant) stuff; and others talk about information science as a new discipline, as if it emerged completely unrelated to the long history of librarianship. "We have paid so little attention to our own intellectual history," Pierce concluded, "that we may have to reconstruct it - almost from scratch."[4] Indeed, we need -- to paraphrase Pierce -- a course in "Dead Librarians," dedicated not to the history of libraries, but to the librarians and their intellectual contributions to our field.

Library philosophy, the intellectual expression of librarianship, developed gradually from the theoretical research in library technology, after it shifted its focus from pure practice to the theory about its operations. The increased attention given to the sociological aspects of these operations provided better understanding of the library role in the cultural processes of modifying behavior of its individual patrons, and of the metaphysical principles governing these operations.

A library social mission was articulated in 1876. It was augmented by new library technological goals of efficient and effective use of graphic records, and codified by a formation of professional organization, defining librarians' professional, educational, and ethical standards.

Librarianship is, in this book, considered as part of a larger universe, extending beyond the concept of the library or information science. The major function of librarianship is to acquire, process, preserve, and utilize recorded data. This, in turn, involves organization and dissemination of recorded data of value to a particular library community. However, these activities are not limited to traditional librarianship. Information gathering and recording were among the first types of activities in any society. The responsibility for general storehousing of information records was delegated to record keepers, the prelibrarians. With the expansion of knowledge and methods of its recording, new library functions emerged to facilitate access to collections and to assist in interpreting their content. Later, these functions expanded into other nonprint media, and beyond the walls of the library. Today, the content and the format are often disjointed and processed separately by a variety of different information agencies. Therefore, a new name for an approach to interpreting various aspects of recorded knowledge is desirable.

I call it *metalibrarianship*, to emphasize not only its interdisciplinary character, but also its focus on the relationships between the essential, minimal, and basic elements in the communication of any recorded data, information, or knowledge.

Metalibrarianship is not a theory in librarianship, but rather is about the nature of librarianship. Horizontally, it is a broad concept, offering an umbrella for a variety of approaches to the interpretation of knowledge records; vertically, it is a model of relationships between the necessary minimum number of elements, applicable to the most, if not all, different interpretations, or viewpoints, about the nature of recorded knowledge. The main point here is that the metalibrary interpretation is not limited to traditional librarianship. It is based on studying similarities, differences, and common denominators among various record-processing activities, from direct library provision of physical records, through the more theoretical transfer of the records' contents (information transfer), to a metaphysical definition of the records' meaning, their cognitive introception.

## 1.3 Assumptions

A few important assumptions are made right at the beginning of the study of metalibrarianship. First, no ideas are created or understood in isolation from a series of related other ideas; no ideas are unrelated. This is shown by this book's constant references to various past contributions to the development of library science.[5]

Second, ideas about reality and their practical applications evolve throughout the history of civilization. They might have been initiated by necessity and integrated into the then existing knowledge. Thinking about reality stimulates awareness of the incompleteness of knowledge by scrutinizing the new answers to previous questions. There are definite retrospective relationships between theory and practice, uncovered by constant philosophical inquiry about them. Consequently, the present study depends heavily on a historical background of ideas. For obvious reasons of limited scope, the references are brief.

Third, although our knowledge of reality is fragmented at best, we assume that total reality is itself a singular holistic system. Learning new knowledge simply means a gradual discovery of some previously overlooked relationships, a process of finding additional pieces in a constantly expanding jigsaw puzzle. The deviations from that assumed uniformity of reality are considered perceptual or logical errors of identity.

Fourth, the final assumption in this introduction is methodological. I maintain that the basic minimal, sufficient relationship between any elements is triadic. The similarities or differences between two elements can be fully understood only with reference to a third element, which provides an essential context for that relationship. As it will be apparent from many examples provided later in this book, the triadic approaches, although not explicitly identified, are at the base of many formulations of theories and models about a variety of relationships.

## 1.4 Objectives of the Study

In this book I attempt to answer some basic questions: What is the essence of librarianship? What is the meaning of information? What are the principles behind a desire for information transfer, preservation of older records, or creation of new ideas?

The operational answers to many of these questions are reflected in library management, which defines its policies, sets objectives, establishes criteria of adequacy, and provides mechanisms for library adaptation to changes.

I tentatively identify Library Information Science (LIS) with the field of studying and servicing records and their content. Records may be of a variety of formats, from print to audiovisual. Information is here defined as a description of data whether in physical or electronic format. It is an essential concept in any model, although its description will vary with different interpretations of information, in, e.g., communication, chemical, electrical, mechanical, or neural systems. The degree of presence or absence of information in any phenomenon determines the scope and accuracy of understanding that phenomenon.

The physical view of information systems focuses on characteristics such as volumes of data, speed of transmission, reliability of system components, and adaptability to other information subsystems. Information as a message conveys the views and intentions of its authors. The value of information to the recipients of these messages is reflected in the market demand for information, measured by the feedback about the recipients' reaction to the received information.

One of the objectives of this study is to identify philosophical aspects of librarianship as expressed in the library literature. It is a search for fundamentals, or a 'knowledge base' of the profession. "Ideally, a profession finds content, context, and methodologies relevant to its activities in subject discipline. It then takes these and applies them to its problems, remaining in touch with the source discipline for innovation and creativity while building its own intellectual foundations. Librarianship shows evidence of this evolution and . . . it is in the process of becoming a discipline in its own right."[6] As M. F. Stieg pointed out, the knowledge base has changed from literature at the beginning of this century, to social sciences in the twenties and thirties, and to metasciences, suggested by A.Kaplan in the 1960s. "The complexities of information transfer and library services have led to a situation where practically no knowledge is irrelevant," [7] making Kaplan's notion even more compelling.

### 1.4.1 Focus of the Argument

Following the review of past contributions, I propose a model for metalibrarianship. I make a distinction among the theory of the discipline, its practical implementations, and its philosophical meaning. Metalibrarianship is a metaphysical speculation about the extralibrary characteristics of bibliographic aspects of information that extend beyond library or information science.

The focus of this study is on the nature of relationships between the content of the messages contained in the carriers of information and their conceptual interpretation by the receiver of the messages. Each interpretation addresses different aspects of relationships. The goal of this model is to relate the categories of different interpretations in one, coherent system.

The relationships are defined internally and interpreted externally from metaphysical, epistemological, and ethical viewpoints. The networks of relations between their internal structures and external interpretations define the discipline of metalibrarianship.

Practical values of the model lie in providing an insight into the intermediary functions of librarians, and in identifying common denominators that unify various and divergent library activities.

Recently there has been a noticeable shift of interest away from the acquisition of data, toward access to them, and from the preservation of recorded messages to their utilization. Yet the basic role of librarians as mediators, linking the sources of information with their recipients, although not changed, is not yet fully understood by many librarians and most library patrons.

### 1.4.2 Tentative Hypothesis

I assume the existence of metaphysical essence, which is expressed metaphorically within a comprehensive philosophical framework of metalibrarianship. It is described differently by different disciplines, for different purposes. Therefore, all recorded knowledge is metaphorical. Metalibrarianship attempts to provide a philosophical framework for a variety of approaches to recorded knowledge. This is an open system, subject to constant modifications.

### 1.5 Emerging Philosophy

Metalibrarianship addresses metaphysical essence, epistemological nature, and ethical values and purposes of information agencies.

(a) Metaphysical essence relates to the basic relationships between recorded concepts and their cognition. They define the ultimate realities of librarianship. Some writers limit the content of the records to information as an energy in the universe, others focus on information-as-data in factual knowledge about anything, or on information-as-ideas expressing subjectivism of intellectual knowledge. To me, the relationships between all relevant concepts, their meaning, and the interpretation by the receiver of the message--all these fall into the category of basic relations.

(b) The epistemological nature of relations describes the processes of balancing the empirical tendencies of reducing ideas to data, with the metaphysical claims of their independent existence. Epistemological validity of these processes is determined by logical analysis.

(c) Ethical values and purposes of library operations are expressed by their ideal goals of providing satisfactory but also objective services to library patrons. In this sense, librarianship is like intellectual cartography, orienting people to specific ideas[8]. Or, as J. L. Wheeler phrased it earlier, it is "the map of knowledge or 'countries of the mind' represented by library collections of published information."[9]

More recently, the metaphor of mapmaking was carried further by R. J. Merikangas to whom it stands for the unifying mental activity of arranging everything in a mental map, from bibliographic instruction to pathfindings and problem-solving schemes. "I see us making maps through our library bibliographic systems . . . [providing] assistance and instructional systems, . . . used by readers who have become mapmakers themselves . . . [creating] mental maps of our systems . . . by which they traverse the maps to the knowledge-places they seek."[10]

## 1.6 Arrangements of the Content.

The content of this book consists of (a) an introduction to the study of the nature and scope of librarianship as a discipline, (b) a description of the philosophical relevance of its subject matter, (c) a proposal for an all-encompassing metalibrary model, and (d) examples of the model's applications to library operations.

Part One briefly discusses the emergence of librarianship. Major accomplishments relevant to the intellectual development of librarianship are noted in Chapter Two. Their impact on the diversification of library functions is traced in Chapter Three, and Chapetr Four brings together definitional disagreements and common denominators of different aspects of librarianship.

In Part Two, the general nature of philosophical inquiry is described in Chapter Five, its applications to the philosophical interpretation of librarianship are discussed in Chapters Six and Seven, providing examples of philosophical debate on the nature of knowledge in Chapter Eight. [11]

Part Three summarizes my previous essays on metalibrarianship, updated and expanded by more recent literature on the subject. Chapter Nine outlines the intellectual environment for the philosophy of librarianship. In Chapter Ten, the concept of information is examined and its role in metalibrarianship is redefined. In Chapter Eleven the theory of metalibrarianship is presented, and a model of metalibrary system is proposed. Possible application of metalibrarianship to the interpretation of library practice is discussed in Chapter Twelve by summarizing philosophical and theoretical aspects of management in general, and by relating the theory of management to the library environment. The chapter includes a comparison between information science, management of libraries and metalibrarianship, and a suggestion of a model for for the redefined metalibrary information science. It ends with a critique of the metalibrary approach, and an epilogue. An appendix listing major contributors to the philosophy of librarianship and cited references completes the study.

The book offers an approach to the discipline that may or may not be accepted by the reader. A consensus here is irrelevant, but constructive criticism, a dialogue that would contribute to a better understanding of the basic premises of librarianship, is highly desirable, since it will reinforce the very purpose of this study. Knowledge of reality is, and always will be, incomplete. It is an open system of evolving objective theories and of constantly changing subjective speculations.

## NOTES

1. The quotation is from Aristotle's "Analytical Posteriori," A-54, *Aristotle Selections*, New York: Charles Scribner's Sons, 1938, p.23.

2. Spencer, H. (1862, 6th ed. reissued 1937), *First Principles*, London.

3. Pierce, S. J. (September 1992). "Dead Germans and the Theory of Librarianship," *American Libraries*, 23(8), p. 641.

4. Pierce, op. cit., p. 643.

5. Source material for this book was collected over many years. Although a real effort has been made to identify all authors cited, some references might have been unintentionally and regretfully omitted. All direct quotations in the book are, of course, verified. I plan to follow the publication of this book with "Notes on the Philosophy of Librarianship," which will review resources consulted but not included in the present study, and will allow for correcting any errors or omission in the present manuscript.

6. Stieg, M. F. (1992), *Change and Challenge in Library and Information Science Education*, Chicago: American Library Association, p. 9.

7. Ibid.

8. Wright, H. C. (1982), " An Interdisciplinary Philosophy of Librarianship," *Annual Conference of the Society of Educators and Scholars* |Microform|, Union, N.J., September 29-October 2,1982.(ERIC ED 227 864), p. 5.

9. Wheeler, J. L. (1946), *Progress and Problems in Education for Librarians*, New York: Carnegie Corporation.

10. Merikangas, R. J. (1987), "Theory and Practice of Library Client Interaction," *The Reference Librarian*, p. 301.

11. Extensive references to other works, especially in the first two parts of the book, are provided to illustrate the multiplicity of direct and indirect relationships between the subject matter of librarianship, its philosophy, and the proposed concept of metalibrarianship, as expressed by writers in and outside the field.

However, since the term 'philosophy' is used in library literature very loosely, often with little or no relevance to philosophical inquiry, references to such essays are omitted in this book.

# CHAPTER 2:
# HISTORICAL MILESTONES IN LIBRARIANSHIP

> The library historically has been, in both substance and function, a holistic agency of society. The substance . . . includes the known records of the totality of humanity's experiences and creations . . . the function . . . ideally relates to every individual, group, agency, or institution as potential contributors or as consumers of library resources.[1]

## 2.1 Philosophical Interpretation of Library History

History is the art of recording past events, and historical scholarship searches for the laws that govern the sequences of historical happenings.

The library historical literature is predominantly about libraries rather than librarianship. It is so partly because the concept of librarianship implies a philosophical underpinning of the field as a unique discipline, a relatively new, and not yet fully developed approach.

Hence, although the history of librarianship provides an important insight into the sociological, political, and technical developments of the discipline, it is of much less help in the study of library philosophy for a number of reasons: (a) The knowledge and understanding of the origin of the discipline are incomplete, based on the accidents of archaeological discoveries. (b) The available record tells us what and how functions were being done in libraries, but not why. (c) There was no need for philosophy until the discipline matured. The need for any theoretical considerations did not arise until the profession was forced to select priorities in terms of available resources. Initially, priorities were strictly defined for the library, while the planning decisions made by library administrators referred to issues that were pragmatic, not theoretical.

Historical review is very important, however, in understanding the reasons for the directions of library development, which is conditioned by the intellectual environment of each period. This book focuses on identifying the basic factors in the growth of the discipline, using arbitrarily selected, historical examples.[2]

Although in this brief review of the development of librarianship the focus is on libraries, the term 'library' is used generically, covering not only a physical storehouse of records, but also their organization, content, and users. Recorded messages ('information' in modern nomenclature), have been central to civilization from the very beginning of written communication and were the raison d'etre for libraries. Nowadays, some writers dwell exclusively on information itself, as if its significance had been only recently perceived, overlooking its constant importance in the past. As N.D. Stevens notes, "what is now proclaimed as an 'Information Age' is, in some sense, a term that can be applied to all stages of human development. The old concept, for example, of an 'Iron Age' can be seen to have its roots in the discovery of information about how iron ore could be transformed into useful objects."[3] Stevens concludes his own essay on the history of information with an observation that "a consideration of how, when, and why certain events took place and particular concepts developed can serve to improve our understanding of how we arrived at the point which we are now at in our consideration of information."[4]

A review of library literature on the history of libraries suggests three possible approaches to the study of the reason for the emergence of librarianship: descriptive, prescriptive, and analytical.

### 2.1.1 Descriptive Approach

This is the most popular way of organizing historical data chronologically into events, their causes, and effects. The implied universal laws, not always easily identified, seem to be the cause-effect relations in historical changes. The approach, referenced in the professional literature as 'the covering law theory' claims "that all explanation of events aims to show that what happened was to be expected, in view of the conditions which preceded it, and that rational expectation is possible only through the assumption of appropriate general laws, which themselves require empirical verification." [5]

The approach is based on the deductive, probabilistic model proposed by John Stuart Mill in his *A System of Logic*, and refined by Popper, Nagel, Hemper and others, as the bases for scientific explanation in general. The approach is criticized for being too general, confusing the premises of explanation with the inferential procedure of deduction, and for interpreting the law itself not as explanation but as the logical grounds for it. It offers explanation by restating, or 'redescribing' the event in terms of what it is, and not why it happened.[6] However, "historians do not seem to support the covering law model, even as an ideal . . . |Since| the vast majority of historians neither do, nor think they ought to, explain by means of the deductive model, that model cannot constitute the correct account of historical explanation."[7]

Library historians usually follow the description of historical events by focusing on the event itself, or on the forces initiating the change, as the cause for whatever are the effects of such activities. Accordingly, they follow the chronology of events or analyze motives of their initiators, frequently individual leaders, and the relationships between the two factors. It is often not clear, however, which phenomena are the causes and which the effects. Did, for example, Gabriel Naudé change the management style of libraries, or did he merely observe and describe the changes already made, teaching others about the advantages of the change rather than initiating it?

A good example of 'redescribing' principles is L. D. Snyderwine's identification of basic motives for recording facts, events, and ideas. The appearance of documentary records, he argues, marks the beginning of a history, which followed a long period of oral prehistory, by allowing for a transfer of ideas and information beyond time and space confinements. And although the art of record making and keeping constantly improves with technological advances, "the essential causes and purposes of the whole operation are the same today as they were early in our history, that is at least to commemorate, to communicate, to pray, to calculate, to measure, and to preserve."[8] Snyderwine describes the reasons for record keeping in terms of the motivation for making records themselves.

Any criticism notwithstanding, the descriptive history is all, or almost all, that we have today, and it is used later in this chapter as the intellectual background for the philosophy of librarianship.

### 2.1.2 Prescriptive Approach

In order to establish the foundations for the philosophy of librarianship, librarians like James Thompson interpreted the history of libraries by implying that certain principles, embodied in the very concept of librarianship, act as a force that actually causes the changes in the development of the discipline. "The essential principles of librarianship," Thompson maintains, "emerge unambiguously and incontrovertibly from our long history."[9] And he cites approvingly D. M. Norris's notion that although "history suggests . . . evolutionary or gradual development, . . . such is not the case with cataloging."[10] The ancient catalogers, Norris claimed, were as proficient as we are today, although they used different methods. She is saying in effect that they merely interpreted the same cataloging principles differently.

Thompson also quotes E.A. Savage's theory of 'occultation', claiming that many of the principles of librarianship, such as open shelf, classed catalogs, and subject classification, were implemented a long time ago. They were hidden, or unrecognized, as basic principles of librarianship until they were rediscovered later on.[11]

This approach is similar to the 'preformism' hypothesis in biology, stating that hereditary characteristics of living organisms are already imbedded in their cells. The organisms develop by unfolding characteristics that already exist in the cell, as an oak seed grows into an oak tree. The history of librarianship is, by analogy, a mere unfolding of the principles that were already present in the beginning of librarianship.

Thompson listed seventeen principles that, he claims, define librarianship *a priori*. All the principles are, in the views of Thompson's critics, retrospective descriptions of (a) truisms (e.g., "Libraries are created by society" -- and so is every other social institution); (b) historically incorrect statements (e.g., "Libraries are for all" -- not all libraries were or are accessible to everybody); (c) imprecise requirements (e.g., "A librarian needs training and/or apprenticeship" -- what kind?); or (d) principles that may relate to sufficient, but not necessary, reasons for the existence of a discipline (e.g., "Libraries are for the storage and dissemination of knowledge").

The value of Thompson's book is in suggesting a description of the parameters of librarianship: the common characteristics of a *kind* of library or librarianship, which are shared with other libraries, but differentiated from nonlibrary institutions.
In this sense they are similar to S. R. Ranganathan's five laws, (derived from but not imbedded in library practice). Most of them are not 'principles', but what M. H. Harris calls the "simpleminded hodgepodge of practices, functions, purposes, and highly questionable pronouncements about the nature of libraries . . . they in no way constitute . . . a coherent philosophy of librarianship." [12]

### 2.1.3 Analytical Approach

Later in this book I propose a model defining the meaning of librarianship in its broad context of basic relationships between the carriers of recorded messages, their content, and their receivers. The model implies an evolutionary development of library mission, within the framework of these relationships, which can be traced in historical progression of library purposes, goals, and objectives.

The theory supporting the model is based on the epigenetic notion of successive differentiation of ideas from simple and undifferentiated to complex and highly specialized concepts. The differentiation itself is caused by the interrelationships between the internal components of the discipline and the external, environmental influences upon them.

The metaphor here is of heredity, of the process in which genetic characteristic, transmitted through chromosomes, determine the makeup of an individual, similar to others of the same kind, but with variations resulting from genes' interactions with their environment. This approach shares, with the prescriptive method, the 'hereditary' paradigms of librarianship. It differs from the other approach by focusing on additional characteristics which emerged from the changing environment of librarianship. The approach follows J. S. Mill's distinction among natural classes, defining the discipline, and number of other properties within the same class. An analytical approach focuses on relationships between properties of primary components of librarianship and their environment.

The primary components are the carriers of records (generic books), their content, (the knowledge they contain), and individuals interacting with them (authors, readers, librarians, etc). The principles of the discipline emerge from the relationships between the primary components, influenced by library processes (e.g., classification or reference), their context (e.g., reading or educational), and the conceptual interpretations of these processes by the participants (their perceptions of what librarianship is, or ought to be).

## 2.2 Historical Perspectives

In this chapter I review briefly major events in the history of libraries in the context of their cultural environment. Social organizations always reflect their communities; the library is no exception. No library-related ideas are developed in a vacuum. Everything has a cause, nothing happens independently of other events or situations. Every writer in the field 'stands on the shoulders of his predecessors.'[13]

Physically, human beings are practically unchanged from the Cro-Magnon's days. "Today's new-born child and the baby of a paleolithic cave man cannot be distinguished. Yet they are destined to lead completely different lives."[14] The lives were transformed through ages of changes into different cultures, each civilization considered "not so much as devices for efficient and intensive food production . . . but rather as organizations for the efficient processing of information."[15]

The biophysical evolution of the human being was probably completed with the emergence of *Homo sapiens* some 100,000 years ago. It was also the beginning of the intellectual evolution of the human race. The period is classified as prehistory because of missing archaeological records that would tell us more about the process. There is, however, some evidence suggesting "that 60,000 years ago Neanderthal people had religious ideas and a concern for the after-life."[16] The numerous stone tools that are extant from the Old Stone Age provide evidence that prehistoric man started modifying the environment to meet his needs by inventing these tools; he also selected them according to the requirements of the task at hand and developed methods of reproducing them. In addition, he learned how to use available information in planning future activities.

Recorded history known to us started with the oldest-to-date archaeological find, cave paintings, in what is today Northeast Spain. They were created during the Old Stone Age, some 16,500 years before the next archaeological discovery, Sumerian tablets. Not knowing the purpose of the cave paintings -- whether to record important events, to express religious feelings, or simply to entertain -- one can at least conclude that prehistoric man already conceptualized.

Tool-making and conceptualizing abilities allowed man to meet his initial needs and wishes. The only basic difference between us and the Neanderthal man is the experience gained through millennia of trial and error. The brain sizes of both are the same.

The span of 5,500 years between the earliest evidence of writing and present computer printouts covers various periods of civilization. Cultures were emerging, flourishing, and eventually dispersing almost simultaneously throughout the world, from ancient Egyptian in Northeast Africa, Sumerian in West Asia, Indus in India, Minoan in Europe, Shang in China, to Olmecs in Central America.

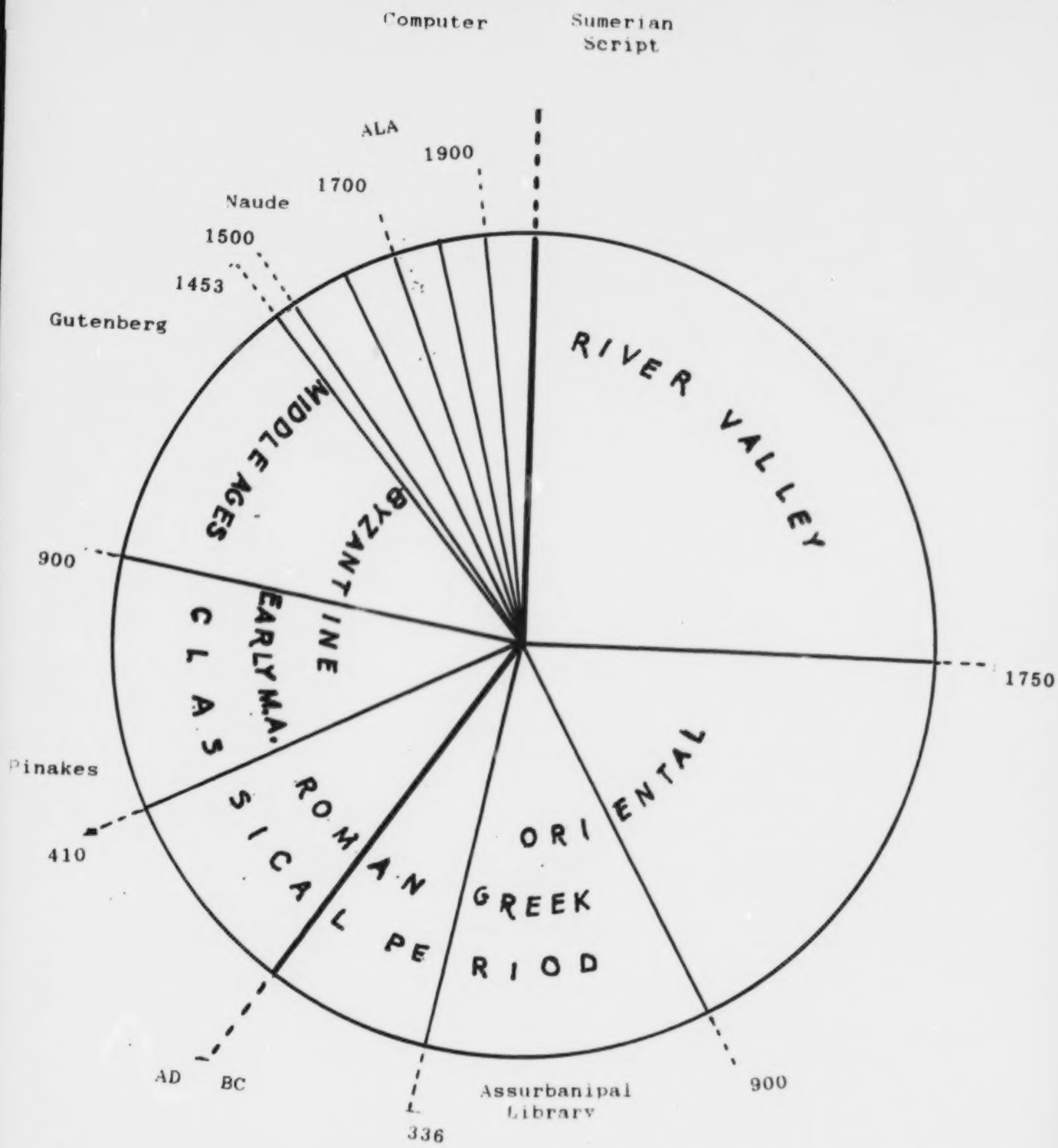
The diagram below (Fig. 2-1) may help the reader to appreciate the process of human cultural growth. In the form of a twelve-hour clock, it represents the period of approximately the last four millennia of human existence. To illustrate the whole history of the human race we would need at least 249 additional clocks, taking us back one million years, to the appearance of the first human beings.[17]

The history relevant to this study covers the period of approximately 5,500 years from the innovation of pictographic writing (ca. 3500 BC) to the computer revolution of the late twentieth century. Almost half of that time, until the construction of the Assurbanipal Library (ca.650 BC), can be considered a pre-library history. In this period writing went through a number of improvements, from pictographic, through heliographic, to the first real alphabet (ca. 1800-1600 BC).

These changes were accompanied by improved writing material: from stone, through clay, to papyrus. The result was the appearance of the first book known to us, the Book of Death (ca. 1500 BC), followed by legal codes and literary creations.

The known history of libraries is 2,650 years old. The largest segment of that history, from the Assurbanipal Library to the invention of print (AD 1400), was characterized by a slow maturation of the discipline, followed by an accelerated development of

2000 AD - 3000 BC



Scale:
1 degree= apprx.13.9 years

FIG. 2-1: WESTERN CULTURAL HERITAGE

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librarianship, accompanied by the explosion of publication activities, culminating in the 'information age.'

What follows are brief, oversimplified descriptions of cultural characteristics of each historical period, followed by a broad discussion of their impact on the evolution of librarianship.

### 2.3 The Beginnings: ca. 500,000 (?)--3000 BC.

The beginning of culture is traced back to the Old Stone Age, at least half a million years ago, the period of *Homo sapiens*, the descendant of the genus *Homo* and the primate family Hominidae. All that we know about this species is that they lived on many continents, with their skeletons found in Africa, Asia, and Europe. The first signs of a primitive society, the cave Neanderthal, were traced to their retreat in the glaciers between 12,000 and 20,000 years ago. *Homo sapiens* hunted, used fire, and believed in an afterlife. Cro-Magnons and other races who followed them demonstrated increased skill in gradually gaining control of their environment. Improved tools testify to their inventiveness, and the discovery of skeletons in many different locations points to the mobility of the races. The appearance of civilized societies in Mesopotamia and Egypt in approximately 3000 BC marks the end of this period.

## 2.4 River Valley Civilizations: 3000 BC-- 1750 BC

The small neolithic settlements in Mesopotamia (present-day Iraq) and Egypt were transformed into larger regions in approximately 3000 BC and flourished until the first general migrations of 1750 BC in Egypt, Asia Minor, Mesopotamia, and Greece.

### 2.4.1 Historical Overview

The first agricultural societies appeared about 8,000 years ago in the Middle East, marking the beginning of a food-producing economy, trade, migration and warfare. Permanent larger settlements were slowly built in river valleys, the best known in the deltas of the Tigris and Euphrates in Mesopotamia and on the Nile in Egypt. These centers, known collectively as the River Valley civilization, mastered the knowledge of regulating the river flow by building canals and dikes for irrigation and transportation. The resulting surplus of crops allowed for extensive trade, the appearance of an influential merchant class, the emergence of cities, and the beginning of pharaonic rule, the construction of pyramids, and urban administration by aristocracy and priests. The invention of writing, the potter's wheel, the plow, and two-wheeled vehicles followed, accompanied by the construction of sailboats, the development of mining, and the process of copercasting.

### 2.4.2 Library--related Implications

Richardson's speculations about the beginnings of libraries may stretch our imagination beyond reasonable doubts (e.g., precosmic libraries of the gods),[18] but he correctly traced the conceptual beginnings of libraries to the mnemonic devices used as the first records of what D. Diringer calls 'embryo-writing': "Man has used all sorts of methods and devices for transmission of thoughts: images, symbols or arbitrary signs . . . carved, engraved, drawn or painted . . . but the first attempts . . . were undifferentiated . . . they could belong to the history of art . . . magic . . . or to the history of writing."[19] Some of these devices must have been saved and shared with others for future use, eventually arranged according to their religious, mythical, artistic-entertainment, or archival purposes. All of these functions are also performed in a contemporary library.

### 2.5 Oriental Civilization: 1750 BC -- 323 BC

The first major migration that followed the invasions of River Valley societies in 1750 BC marks the beginning of the oriental civilization. (Fig.2-1) The region became dominated by the Indo-Europeans from the Caspian Sea, who gradually conquered most of Europe, followed by Semites from the south and native Egyptians. The period ends with the death of Alexander the Great in 323 BC.

### 2.5.1 Historical Overview

The new civilization was characterized by development of bronze and iron, the use of horses and camels, and the construction of permanent roads and seagoing ships. In this period the alphabet was developed, in ca. 1400 BC., initiating record keeping for commercial and administrative purposes.

A new social structure evolved which included royalty, priests, soldiers, administrators, and semi-free or slave artisans and peasants. Administrative technique was highly developed and called for dividing the country into provinces, with government responsible for collecting taxes and maintaining a well-equipped army.

The culture of the period included unique art and sculpture, highly advanced astronomy, and religious movements such as monotheism in Egypt, Sumerian mythology, Zoroastrianism in Persia, and Hebrew religion in Palestine. One of the most significant individuals of this period was Alexander of Macedonia, conqueror of the Orient, who brought Greek culture to the new empire.

At the time of the emergence of Western culture, independent civilizations developed in other parts of the world, generated by neolithic influences in India, China, and Japan, and by isolation from Eurasian civilization in the American civilizations of the Mayans, the Incas and the Aztecs.

### 2.5.2 Library-related Implications

Librarianship evolved gradually in response to the cultural needs of its society. Some of today's library activities are easily traced to antiquity.

Preceded by oral history, pictographic writing started to document the history of various civilizations. This writing began as a visual method of recording the sound of the language. The concept spread with the migrating populations from one civilization to another, gradually adapting the technique of writing to the material available in each region. For a long time writing was reserved for the privileged elite; the scribe's proficiency in copying texts was acquired in scribal schools. The profession of book writers began.

At first, the purpose of writing was to record the rules of the administration, to keep account of various activities, to praise the ruler, or to guide the soul in the afterlife journeys. The Book of Death, the earliest known record of human intellectual curiosity, expressed beliefs in the immortality of the soul and in the bearing of conduct during life on earth on human afterlife.

Formal inscriptions on monuments, informal funeral texts, and even more informal texts written on pottery served to record historical events, often with propagandist praise of the king (e.g., 'The Story of Sinube'); to advise (e.g., 'The Book of Proverbs'); or to entertain (e.g., 'The Shipwrecked Sailor'). Even in this early period, some writings were used as literary means for escaping reality (e.g., 'A Dialogue of a Pessimist with his Soul'). Love poems, hymns, and prayers were poetic in nature. Business and legal records, mathematical treatises and astronomical works reflected a mixture of speculations and observations, while private letters revealed the daily concerns of people -- concerns which were not much different from our own.[20] World literature was born. The stage had been set for the collection, preservation, service, and management of written records.

The first known library of antiquity was built by the Assyrian king Assurbanipal (668-626 BC) some three thousand years after the invention of writing. The content of the library indicates the existence of an already widespread Assyro-Babylonian literature. The library had its own staff, the books were arranged by subject, and the catalog provided access to their location. "There were deeds, documents, and letters; religious texts; historical accounts; and works in the most diverse fields of knowledge . . . to serve state as well as church, to promote the lasting fame of its founder as well as scientific knowledge."[21]

According to Thompson, in the library at Edfu in Egypt, known as the "House of Papyrus," the arrangement of the collection suggested the beginning use of crude cataloging, classification, and descriptive bibliography. In Babylonia and Assyria, tables were numbered according to their location in the library, with series named from the first tablet. "In the Kalakh collection, under the direction of a librarian called Nabu-zuqub-gina . . . (716--684 BC) . . . the catalogue entries included the title of the work, the number of lines, the contents, the incipit or opening words . . . and each of its important parts or subdivisions."[22]

The history of archaeological artifacts teaches us a simple lesson: "that there is no single path to civilization, no pattern of unilineal evolution which all different early complex societies independently follow . . . no single centre of diffusion from which all major advances spread."[23] Furthermore, civilization, like science "develops in close correspondence with the stages of man's social progress and becomes progressively more self-conscious as man's whole way of life becomes more purposive."[24]

Both these interpretations support the concepts of comparative librarianship based on the unquestionably unique social roots of each library.

### 2.6 Classical Civilization: ca. 900 BC--AD 900

"Classical civilization may be defined as the pattern of social life which grew up in the Greek city-state, spread through the Mediterranean basin, reaching its maximum extent in the time of the Roman Empire, and then broke up gradually through a period of barbarian invasions."[25]

This long historical period began with the emergence of Greek city states, (ca.900 BC) followed by the Roman civilization (beginning with Punic wars in 264 BC, ending with the fall of Rome in AD 410). The period is further extended by the inclusion of Byzantine civilization (from the fall of Rome to the fall of Constantinople in AD 1453) and the first invasion of central Europe by Hungarians in AD 900 AD.

### 2.6.1 The Greek City-States: 900 BC -- 336 BC

Classical civilization emerged from ancient Minoan and Mycenaean civilization, and from the Greek 'Dark Age.' Its past was described in Homeric epic poetry of the eight century BC.

#### 2.6.1.1 Historical Overview

The period was characterized by rapid population growth, peaceful colonization of other countries without interfering with the local population, increased export of woolen cloth, and the exchange of needed raw materials for pottery and metal products. The agricultural sector specialized in cultivating olives and vines, which were traded for grain from other Mediterranean countries.

The aristocracy dominated society, which included slave-artisans, foreign-born merchants, tenant farmers working for the aristocracy, and professional soldiers defending their interests.

A new form of government, oligarchy, transferred the power from nobility to wealthy merchants. Greek religion was characterized by mystic celebration of Dionysos, the god of wine; communication with gods through Delphic and other oracles; and the dedication of gymnastic competitions at Olympia. Introduction of vowel signs simplified alphabetic writing, freed readers from memorization techniques, and stimulated prose and poetry. Monumental Greek architecture, known for its proportions, the details of its construction and its distinctively decorative Doric, Ionic, and Corinthian styles, is well appreciated today. Sculptures of athletes and decorative pottery completed the Greek artistic tradition.

Greek philosophy and science, free from the orthodoxy of Oriental culture and local mythical/religious explanations of reality that were often contradictory, developed rational bases for intellectual inquiry. Prose writing, explanations of the physical universe, and philosophical speculations were all based on rational methodology. Thales of Miletus, Pythagoras, Socrates, Plato, and Aristotle were the philosophers of this era.

The Hellenistic period (334 BC--146 BC) began with Alexander the Great succession as the king of Macedonia in 334 BC. In the thirteen years of his reign he radically changed the political and cultural makeup of world civilization. His military conquests were accompanied by Greek migration into new lands. The resulting mixtures of cultures led to new military technologies, more advanced city planning, various mechanical inventions, social innovations in banking, improved education and literacy, increases in book publishing, and the spread of Greek as a common language. Production and distribution of goods were state controlled, necessitating the introduction of administrative bureaucracy. Foreign trade extended to China and Europe. and the period was marked by economic interdependence and specialization.

Socially, a clear distinction was made between the ruling Greeks and the native population, and between rich and poor, with the oligarchic form of government transplanted to the conquered lands. Philosophy substituted for ethical teaching among wealthy citizens, while lower classes shared religious worship of their rulers. This practice resembled modern patriotism, combined with a mystic belief in the gods' influences on people's lives.

The art of the previous period continued to flourish and was adopted in everyday life. Literature was extremely popular, although little of it survived. Science was separated from philosophy by the development of speculative, heliocentric, and geocentric theories in astronomy that seemed more realistic at that time. Geometry was codified, and mathematics was applied to the physical sciences and to engineering. Systematic studies of anatomy expanded the science of physiology; data collected in biology contributed to pharmacy and were cataloged in Theophrastus' book *On Plants*, which became the standard reference, used for centuries.

In literature, earlier Greek classics were edited by Alexandrian scholars. In philosophy, Plato's Academy centered on scepticism, Aristotle's Lyceum on eclecticism, and the new schools of the Cynics, the Epicureans, and the Stoics concentrated on ethical issues, turning philosophy into a way of life.

### 2.6.1.2 Library-related Implications

The Hellenistic period was characterized by oral communication, with recitation preferred over the silent readings of manuscripts. The Socratic seminar method might have significantly contributed to the art of thinking and argumentation, focusing more on issues of relations than on facts. Greek became one of the most flexible languages, and sufficiently precise; but the period was also marked by the phenomenon of Sophism, with its often endless, unfocused discussions. Books were primarily used as aids to memory.

H. C. Wright "regards the nomadic bard traditions, including the Homeric tradition, as the oral surrogates of librarianship."[26] He illustrates this by describing a Greek 'mnemon': the memory man, whose function it was to memorize business transactions, thus performing an archival service.

The shift to written communication, which took place between 320 BC and 100 BC, increased the number of manuscripts and the revival of libraries. "Aristotle, unlike Socrates and Plato, had a large library, and was interested in factual information."[27]

The tradition of the library of antiquity continued in the classical period of Greek literature. The Library of Alexandria resembled in many ways the Assurbanipal library's organization. As pointed out by A. Hessel, both were founded by reigning kings, both provided universal coverage of available literature arranged in a similar fashion. There were, however, also major differences in the format of material collected: clay tablets in the Assurbanipal library and papyrus rolls in the Alexandrian library. The two libraries were separated by four centuries of relative inactivity under the reign of Medo-Persian kings.[28]

The librarians at the Alexandria library were scholars and teachers of royalty, editors of Greek literature who contributed to the sciences of the day, such as mathematical geography and lexicography. The library at Pergamum, as its name may suggest saw the introduction of a new book format, the pergamene roll.[29]

### 2.6.2 Roman civilization: 753 BC--AD 410

Long after the founding of Rome in 753 BC, and following centuries of wars with its neighbors, Roman civilization reached its zenith after the Punic wars in the third century BC. The period ends with the fall of Rome in AD 410.

#### 2.6.2.1 Historical Overview

From the early stage, Roman political power was in the hands of senatorial aristocracy, which controlled life in Rome and in the conquered provinces. The major contributions were made in jurisprudence, which became based on legal precedents. Greek culture dominated Roman life, influencing the arts, literature, and philosophy. The art of oratory as a staple subject of intellectual discourse survived into the Middle Ages and beyond.

With the gradual weakening of Roman class structure in the third century and political disorders in the following century, the Christian Church gained strength and significance. Meanwhile, the division of the Roman Empire between the two sons of Theodosius precipitated the final decline of the West Roman Empire, which formally ended with the capture of Rome by Visigoths in AD 410 AD.

### 2.6.2.2 Library- related Implications

Romans continued the Hellenistic tradition in aesthetics, scholarship, and literature, all initially written in Greek, "very much as eighteenth-century Europeans used French in order to deal with ideas and feelings for which they felt their native languages too crude."[30]

The period represented an adaptation and further incorporation of Greek culture into Roman, the assimilation of the enemy's culture being a familiar phenomenon throughout history. The Roman aristocracy's appreciation of books led to the introduction of the first public library in Rome, the Atrium Libertatis. According to Burke, the Romans were very practical, realistic, and inventive, but they were also sentimental humanitarians; this paradox explains the inconsistencies of their behavior. "The later Romans, like ourselves, had come to hold a low opinion of the personality that suffered, and a high one of the suffering itself."[31] Most of the book collections were built from war booty; private libraries were owned by the wealthy people, and the libraries themselves were often pretentious and status-driven. Among the best known private libraries were the collections of Cicero, Atticus and Varro, followed later by the libraries of Augustus, Tiberius, and Vespasian. They contained mostly Greek scholarly and literary books. In the fourth century AD Romans lost interest in libraries all together.

The Roman conception of a library was a large building, well ornamented, attached to the temple, with books cataloged and stored in wooden chests. Some of the books circulated, and the collections were administered by priests. The religious connection of Roman libraries was later extended to the libraries in the monasteries of the Middle Ages.

The thousand years separating the classical period from the Renaissance encompassed the fall of both Rome and Constantinople, the barbarian invasions of Europe in the fifth century and another invasion by Turks in the fifteenth century. Gradually, Roman civilization declined; the philosophies of stoicism and epicureanism yielded to Christianity and its focus on personal consciousness.

### 2.6.3 Byzantine Civilization (410 BC -- AD 1453)

Under the name of Byzantine, the East Roman Empire survived the fall of its eastern branch until its conquest by the Ottoman Turks in 1453.

#### 2.6.3.1 Historical Overview

Byzantine culture was strongly influenced by Greek civilization, and although it was not innovative, it significantly influenced eastern European societies by means of their conversion to Greek Orthodox Christianity. Later it was also instrumental in the rediscovery of Greek classics in Western Europe, through the works of Byzantine and Arab scholars.

### 2.6.3.2 Library- related Implications

The library and academy built by Constantine acquired a large number of Christian texts, most of them lost in the fire of AD 476. The remaining ancient manuscripts were compiled and analyzed with biographical notes for the authors by Photius (d. 897/8). His work was followed by encyclopedists and restorers of old manuscripts in ecclesiastical and monastery libraries. The monastic rules for librarians, libraries, and scriptoria were set by abbot Theodore of Studium (d. 826). In the fifteenth century, many of the holdings of Byzantine libraries were brought to Europe to serve as core collections for Renaissance philological and historical research.[32]

## 2.7 Transitional period: AD 410 -- AD 900

A five-hundred-year-long transition period in European culture began with the fall of Rome and ended with the collapse of the Carolingian empire after the death of Charlemagne.

### 2.7.1 Historical Overview

This period is characterized by a significant movement among the various peoples, fast-changing political rules, and the waning of Roman civilization during Europe's Dark Ages. The quality of life deteriorated, with increasing reliance on local self-sufficiency to defend against barbaric invasions. It was the period of church dominance in public life and of monasticism, with a temporary economic revival during Carolingnian monarchy.

### 2.7.2. Library-related Implications

Charlemagne's educational reform included establishment of a palace school responsible for teaching, collecting, and copying manuscripts. A new, smaller, and more legible form of lettering was introduced and is known today as 'Carolingian minuscule.'

## 2.8 Middle Ages: 900--1500

The medieval revival of civilization started with the shift in Germany from Carolingian rule (AD 914) to that of Otto the Great (926--973); it ended with the century of discoveries in 1500.

European culture had its origin in classical Greek and Roman Judeo-Christian civilizations, the influence of which was continuous and uninterrupted. Considering the Middle Ages as the beginning of European culture is arbitrary, based on political and economic rather than cultural considerations. The more pronounced characteristics which distinguished European culture began with the spread of Christianity in the fourth century and the revival of classical culture in the fourteenth and fifteenth centuries.

### 2.8.1 Historical Overview

Pre-medieval Western Europe was characterized by manorial agriculture, civil and church feudalism, the growth of military aristocracy, wars, and the cultural penetration of the Eastern and Northern parts of Europe. The cultural revival in classical education, stone architecture, and polyphonic music centered around the church, whose influence began in the eleventh century and lasted until the end of thirteenth century. "A new and brilliant civilization arose in western Europe, emerging from the crudity, ignorance, and poverty of earlier centuries."[33] This era of Catholic Church domination saw the growth of market towns, expanded trades of raw materials in exchange for foreign luxury items, and metallurgic manufacturing. Gradually the feudal system changed to more liberal forms of local government. Church pageantry, splendidly displayed in its services, architecture, and music, influenced secular sculpture and painting. Popular at the time was classic literature written in Latin and epic poetry and romantic lyrics in vernacular languages. Platonic mysticism, realism, nominalism, and Aristotelian rationalism were the focus of intellectual debates. They separated theological speculations from philosophical analysis and recognized science as an independent discipline.

In the fourteenth and fifteenth centuries competition among merchant guilds, the introduction of interest on loans, the Church's slow adjustment to changes, unrest among the peasants, and the influx of new ideas from abroad led to the rise of numerous religious heresies which both defended and attacked the secularization of life.

## 2.8.2 Library-related Implications

The beginning of the Middle Ages (AD 400-600) is characterized by a decline of pagan classical culture and the emergence of Christianity, with the Bible, written in Latin, as the principal book.

"Canon law became more important than civil, monastic communities replaced the towns, theological writings overshadowed belles-lettres, and monastery and cathedral schools flourished while the old educational system declined . . . the pamphlet was preferred to the volume, and classic texts were reduced to meager anthologies, epitomes, and synopses."[34]

The development of libraries in the Middle Ages began with the closing of Roman public libraries, the decline of scholarship, and assignment of responsibilities for the preservation of the records of culture to clergy and monasteries. The format of the book changed from papyrus to parchment and codex, influencing library architecture and the internal organization of material. Books were arranged by subject, size, or acquisition, and the main subjects used at the time were theology, secular works, and textbooks.

Among the first important library intellectual leaders of this period was Saint Benedict, the founder of the Monte Cassino monastery, and the scholar Callimachus, the author of *Pinakes*, the first written library rules and the library catalog of manuscripts. *Pinakes* subdivided manuscripts by format and subject into 120 classes, arranged alphabetically by author, title, and first line with brief annotations. For a long time *Pinakes* "enjoyed a canonical reputation and formed the basis of all later bibliographies of antiquity."[35] Benedictine rule stressed the concept of community, philanthropy, and services, emphasizing the importance of reading as contemplative rather than intellectual activity.

Cassiodorus was the founder of the monastery at Vivarium, a kind of ecclesiastical academy dedicated to the preservation of classics. His administrative contributions included a prescription for the proper arrangement of work in scriptoria and scholarship which stressed precision in the copying of documents for other scholars. This precision was difficult to achieve because the manuscripts were reproduced by monks who frequently were unable to read what they were writing. Later, scriptoria shifted from ecclesiastic to commercial organizations that focused on copying old books and manufacturing new ones, effectively separating themselves from libraries and their functions as centers of learning.

In the second period of the Middle Ages (AD 600--1100) parchment had already replaced papyrus and the monasteries were fully engaged in transcription of ancient literature onto the new medium. Due to clerical errors, this increased the risk of changing the original text in the process. The stiff cover of the parchment radically changed the format of the document, affecting the library method of storage and shelving. The permanence of parchment and the ease of handling in the new format significantly contributed to an increase in the circulation of manuscripts, a clear advantage over the original papyrus.

The changing format of recorded knowledge symbolized the decline of pagan culture and, with it, its libraries. The Roman Empire collapsed and the Church filled the gap, establishing itself as the main cultural force. The activities of Irish and Anglo-Saxon missionaries contributed to the spread of manuscripts and of Catholic religion throughout Europe.

It was also the period of the earliest recorded court decisions concerning 'copyrights.' The ownership of literary text was given to the owners of paper and parchment, not to the book's author or scribe, although the painter retained his rights to illustrations in the manuscript. This practice was similar to the modern publisher's rights to text, quotes, etc.[36]

A short break in the Dark Ages emerged during the Carolingian Renaissance of the twelfth century (AD 751-987). It was characterized by the revival of learning, classical knowledge, and culture. The education system consisted of free village, monastery and cathedral schools, some with small libraries averaging 300 manuscripts. The programs were divided into the trivium and the quadrivium. It was the age of library discoveries: classical manuscripts were found, copied, and disseminated. Scribes, usually at the rank of bishop or abbot, performed important social functions in promoting lay culture and vernacular language.

In the period between 1100 and 1400, medieval culture reached its highest point, followed by a decline of Church supremacy and the emergence of the middle class. Awakened curiosity opened the way to the next period of geographical discoveries and the Renaissance. A significant increase in intellectual activities was reflected in a corresponding rise in the number of published pamphlets. The demand for printed material speeded up the invention of print. This was a period of emerging universities and growth in the number of royal, private, and university libraries.

Overall, the medieval period is characterized by emphases on the rational processes and on logic over observations. Debates concentrated on differences between methods and material, process and product, logic and learning, "hence it could conceive the scholar as ignorant but never as stupid."[37] The educational focus at universities changed from oral defense of theses to written dissertations, a change which increased the demand for textbooks and bookstores.[38]

New commercial renting libraries were licensed by university authorities to the stationarii, for renting and copying manuscripts for sale. The license imposed the responsibility for the correctness of the text on the stationarii, giving them at the same time a monopoly for a rental system. This function was distinguished from the librarius, who was then a forerunner of the contemporary secondhand dealer. The university library collection was for internal, reference use only. Library practice was codified by Richard de Bury in 1345 in his *Philobiblion*.

## 2.9 Modern World: 1500-

The modern world began with the discoveries of the American continent in the 1500s and ends with our own time.

### 2.9.1 Historical Overview

The sudden import of gold to Europe, followed by severe inflation, benefited trading merchants and weakened feudal nobility. Centers of commerce moved from Italian to Dutch and other enterpreneuners, and new joint stock companies were formed to subsidize international trade. Scientific discoveries directly influenced technologies, improving navigation, military equipment, and mining industries.

The unity of European Christendom was shaken by Luther's call for church reforms, followed by the establishment of the Protestant movement and consequent religious revolutions and wars. The controversy was manifested in the ethical extremes of piety and bigotry, toleration and intolerance, leading in the eighteenth century to intellectual revolt. Slowly the impact of Copernican theory, the power of new mathematical analysis, new insight into the physics of the universe, and medical explorations of the human body changed the perception of reality. The philosophical concept of natural law replaced religious influence on social and political life and further contributed to the definition of modern culture.

In the century preceding the French and American revolutions, Europe was still governed by monarchy and nobility, but with increased political, economic, and cultural diversity among the individual countries. Cosmopolitanism, religious indifference, faith in scientific reason, and belief in progress were reinforced by radicalism in vernacular literature, which was critical of the status quo. A philosophy of human reason reinforced the credo of Enlightenment, that all people are by nature good and are entitled to life, liberty, property, and equality. The new political thinking foreshadowed the American and French revolutions. The call for liberty, equality and fraternity was echoed in nineteenth century slogans for liberalism, socialism, and nationalism.[39]

The Industrial Revolution started late in the eighteenth century and extended into the next century. It was initiated by introduction of power-driven machinery, a merge of scientific theory with economic policy, rapid population growth, increased agricultural and industrial productivity, and development of transportation and communication. In art, symbolism and abstraction replaced Renaissance perspective by introducing multiple viewpoints of distorted shapes and colors. Literature and music become nationalistic. However, the period also produced universal art in all its forms, defying any classification and appealing to people all over the world.

Today, intellectual revolution continues to be reinforced by scientific accomplishments, illustrated by man's walk on the moon, and by limitations, such as the inability to end poverty in the Third World. The range of modern culture stretches from universal theory of relativity to psychoanalytic irrationality of the human mind, philosophical belief in rational explanation of reality, and existential revolt against rationalism. Political and religious radicalism formulated theories of positivism, dialectical materialism, and humanism, each challenging established beliefs of the past.

Twentieth-century wars and economic depressions ended European autonomy and domination of the world. Science and technology changed lifestyles, while computers expanded human power to manipulate ideas and exercise governmental control of economic activities. Philosophy refocused its attention on itself, defining its scope, explaining its methodology, and justifying its search for the meaning of reality. And, finally, nuclear energy opened new, not yet fully understood potential for the next period in human culture.

### 2.9.2 Library-related Implications

This period may be considered in five segments to view library-related implications.

### 2.9.2.1 The Renaissance: 1400--1600

With the discovery of the American continent and the Pacific and South Atlantic Oceans, and with the advent of Copernican theory and the Reformation, the concept of human primacy was shaken. Knowledge of the environment expanded, and the twenty million volumes published in this period forever replaced handwritten books. Classical literature was revived, along with the focus on the individual.

Universities began to grant graduate (e.g.,B.A., M.A., and Ph.D.) degrees, and carefully selected books were accepted as final authority. To avoid the influence of unauthorized, 'corrupted' texts, oral teaching and dictation were introduced. There were three types of books in the university: (1) stationary books for rent, (2) college-owned books for teaching, and (3) books in commercialized libraries, rented as texts, either dictated by teachers (*edicta*), or rendered as student's notes (*reportata*).

Libraries were engaged in intensive collection of materials and objects from antiquity, with major centers of activity located in Venice and Florence. Philological and historical research stimulated an emergence of new libraries, among them one in the Vatican.

A major difference between medieval and Renaissance libraries was in the area of public access: Renaissance populace had access to libraries which only medieval clergy could use before. However, in both the medieval and the renaissance periods, the collections offered relatively little encouragement for the emerging culture. The classification and cataloging rules and procedures remained the same, and printed books were excluded from library collections until the end of the Renaissance. With Gutenberg's invention of printing, the "close connection between the makers and the collectors of books was dissolved forever."[40]

The post-Gutenberg period was characterized by a print explosion. In the first fifteen years of printing, eight million books were published. A new book trade developed, and with it, plagiarism. To accommodate an enlarged reading public, municipal libraries were organized. The Protestant revolt brought humanism and renewed interest in Classical literature, increased preservation of old manuscripts, and the introduction of vernacular literature. This was also the beginning of scientific, legal, and historical bibliographic studies of ancient philology, specialized medicine, and legal systems. These were compiled by the scholars themselves and constituted the first bibliographies in their fields.

### 2.9.2.2 The Seventeenth Century.

The seventeenth century manifested a modern scientific spirit characterized by examination of historical texts and focus on facts and experimentation. Scholars continued to read extensively in the narrow subjects of interest to them "but did not seem conscious of the powerful potential held by the book itself as the expression of universal thought."[41] At the same time, interest in pure bibliography, which was initiated in the previous century, spread through Europe. It laid the groundwork for a new science of bibliography which researched printed texts, produced specialized bibliographies, and shifted attention from the reader to the book itself.[42]

Fast-developing printing technology, an increased number of books, and an expanded reading public led to the gradual evolution of librarianship as it moved away from its preoccupation with the physical aspects of a library and its records, toward the emergence of librarians as mediators and brokers of information.

Naudé (1627) proposed a model for a universal library based on a collection that would represent major contributions to knowledge, both in original languages and in translations. In his model, the library would cover all disciplines, interconnected by available reference works. For him, the best classification was one that was "easiest and most natural," and his main principle was the notion that "a collection should not only promote the fame of its owner but should at the same time satisfy the needs of the public."[43,44]

### 2.9.2.3 The Eighteenth Century

In the eighteenth century, reading became very popular. This popularity contributed to increased knowledge of different cultures, and, with it, a development of a nonconformist attitude, freedom of choice, hostility to authority, and a new philosophy.

This period also marked the beginning of the reconstruction of history by publications about discoveries not only of new continents but also of new ideas and cultures.

Subscription and circulating libraries, together with reading societies, were organized throughout Europe and America. Dictionaries and encyclopedias were popular, and a number of special bibliographies, both universal and national, were published. Subject bibliographies, according to Malclès, reached their apogee, with fast-developing commercial and technical bibliographies. However, the role of the bibliography had not yet been clearly defined.[45]

### 2.9.2.4 The Nineteenth Century

The nineteenth century began in Europe with the impact of sudden changes created by a decline of royalty and nobility, nationalization of religious orders, and a transfer of book ownership in the last decade of the eighteenth century. Concern about the destruction of books led to indexing and to the science of books.

The professional bibliography was initially created by booksellers. The new environment created by geographical discoveries, public education, universities, and learned societies increased interest in intellectual publications. The stabilized book trade, an increased number of periodicals, the establishment of archives, and improved access to libraries required better management of library resources.

The first technical works on bibliography as a profession were published, making a distinction between general and scientific bibliography and giving rise to the science of bibliography. Bibliography shifted from a preoccupation with authors to an interest in their works. It was defined as an awareness of the products of the mind, recording the intellectual activities of the day.[46]

By the end of nineteenth century a distinction was being made between 'librarianship,' focusing on acquisition, organization, and interpretation of collections, and 'documentation,' studying the issues related to nonmonographic publications and utilization of technical facilities in literature research. This was also a period during which different types of libraries, such as public, special, and school libraries, quickly developed.

### 2.9.2.5 The Twentieth Century

In libraries, the beginning of the twentieth century was characterized by careful selection of relevant material from the mass of publications, introduction of the division of work in library administration, and elimination of dated ideas by weeding. Publications of retrospective bibliographies of fundamental works were designed for the use of researchers and therefore were created with specialized scope. Each discipline developed its own bibliography, and government became more involved in organizing its information systems.

The 1950s marked the start of rapid developments in computer technology and its application to library operations. Library automation at first was applied to basic library services such as text transcription, indexing, abstracting, document selection, information retrieval, processing ordering, cataloging and serials management.[47]

It was a significant conceptual shift from the notion of adapting some library operations to what a machine could do (e.g., typing cataloging cards), to utilizing the machine's potential to provide service (e.g., keypunched instructions, and later more sophisticated information retrieval). The change was made possible in part by technical innovations that allowed for a switch from exclusively arithmetic calculations performed by machine to other mathematical functions. Furthermore, the instructions to the computer could be defined in symbolic, non-numerical codes, automatically transcribed by compiler code into binary, machine readable codes. This facilitated development of languages to design programs, such as FORTRAN (Formula Translation for Mathematicians), COBOL (Common Business Oriented Language), and other specialized programs.[48]

In 1951 the introduction of the first electronic computer, UNIVAC, was followed by the second-generation transistorized computers of the early 1960s, the third-generation, integrated circuit computers in the late 1960s, and the fourth-generation large scale integrated circuits (VLSI) computer in 1980. The importance of the invention of integrated circuitry was compared to the invention of printing. In both cases, the machine was designed and the circuits were built only once, to be reproduced mechanically a number of times later.

Fast expanding computer technology was followed by an upsurge in the amount of attention paid to the users of computers, implementation of the notion of 'user friendly' computers, and development of interest in machine-human interface software. The phenomenal increase in the speed of computer operations and in the size of computer memory allowed for expanding applications of computer technology to the organization, management, and retrieval of information, stimulating new research into the theory of the discipline of library information science.

However, as T. Roszak reminds us, the computer is not a panacea. Its basic limitations are defined by human imperfections: "This inability of the mind to capture its own nature is precisely what makes it impossible to invent a machine that will be the mind's equal, let alone its successor. The computer can only be one more idea in the imagination of its creator."[49]

While computer technology changed the production of published information, shifts also occurred in scholarly communications. Twentieth-century research in library and information science followed, although slowly, the changing paradigms of scholarship. The focus changed from sociological emphasis on library patrons considered as a group and system-centered management, to psychological study of the cognitive processes in information transfer.[50]

The twentieth century is also witnessing an emergence of format diversity (e.g., optical, imaging, audio-visuals) and new communication media (such as extensive use of telephone data networks, fiber optics, fax, and e-mail). These have resulted in such innovations as the option of availability of on-site and remote access to resources, not to mention the new function of library instruction. All these changes significantly affect the definition of library information science.

With the increased complexity of information systems, the managerial and interpretive roles of the librarian will be further expanded by focusing on the importance of critical review and synthesis of expanding literature, in all formats from print to electronic. There is a need, not yet fulfilled, to "integrate the facts and findings of many articles, to clarify issues and to suggest where additional research is needed."[51] To meet this new challenge, the whole educational curriculum for library and information science will have to be revised, with more emphasis placed not only on subject specialization but also on philosophical sophistication.

At each stage of library development, the discipline had a number of optional directions to follow. The directions chosen always reflected the cultural environment at the time, the state of technology and the intellectual curiosity of the period. The historical judgment of the decisions made by each successive generation of librarians should always be made in terms of the degree of success or failure in meeting the society's needs and expectations.

## 2.10 Conclusion

Shera succinctly summarized the impact of historical changes on the "library as an agency of communication . . . [revealing] a variety of forces and pressures that have shaped and reshaped its social role."[52]

Throughout history, Shera noted, the library preserved records essential to church and state, serving as a 'handmaiden for power and authority' of monarchic, church, and civil agencies. It gained a social status by developing archival resources for scholars and by providing assistance to education, nobility, and special interests. Following political and industrial revolutions, the library was required to serve 'the common man': "It brought together, perhaps for the first time in the long history, not a tight homogeneous little worlds of philosophers, divines, or scientists, but men from many walks of life . . . who might find in its resources a common bond of understanding."[53]

## NOTES

1. Reith, D. (1984). "The Library as a Social Agency." In A. R. and McChesney, K. Roger, *The Library in Society*. Littleton, Colo.: Libraries Unlimited, p.5.

2. For overviews of library history summarized in this chapter see Hessel, A. (1955), *A History of Libraries*, New Bruns wick, N.J.: The Scarecrow Press (translated, with supplementary material by Reuben Peiss; Reuben Peiss Memorial edition), J. M. Smith, *A Chronology of Librarianship*, 1968; K. McChesney's essay on "History of libraries, librarianship, and library education." In Rogers and McChesney, *The Library in Society*, Littleton, Colo., Libraries Unlimited,1984, pp. 33-60, and J. Gates's *Introduction to Librarianship*, New York: Neal-Schuman Publishers, 3rd. ed., 1990.

3. Stevens, N. D. (1986), "The History of Information." In Simonton, Wesley (ed.), *Advances in Librarianship*, vol. 14, Orlando: Academic Press, p. 2.

4. Ibid., p. 44

5. Dray, W. H., "Philosophy of History," *The Encyclopedia of Philosophy*, Paul Edwards, ed., New York, Macmillan, 1967, v. 6., p. 248.

6. Kim, Jaegwon, "Explanation in Science," *The Encyclopedia of Philosophy*, op. cit., vol. 3, pp. 159-163.

7. Weingartner, Rudolph, H., "Historical Explanation," *The Encyclopedia of Philosophy*, op. cit., vol. 4, p. 10.

8. Snyderwine, L. T. (Summer 1981). "The Philosophy of Recording Knowledge," *Journal of Educational Media Science*, 18(4),p. 34.

9. Thompson, J. (1977). *A History of the Principles of Librarianship*. London: Clive Bingley, p. 11.

10. Ibid., p. 10.

11. Ibid.

12. Some readers may take objection to my selection of this book for describing the prescriptive interpretation of history. The book was severely criticized for its poor research and unjustified conclusions. For example, M. Henderson states that the "book should never have been published. It adds nothing to our knowledge; if anything, it merely confuses - or at least trivializes - a number of issues." Others, however, like Lyle, claim that the book is valuable because it provides a theoretical review of changing historical (but not philosophical) foundations of librarianship.

Thompson's hypothesis is cited here, not for its historical contribution, but as an example of a preformist interpretation of the origins of library principles. His hypothesis, which so outraged its critics but also made my point, reveals the very difficulties in arguing for some predetermined motives in the development of librarianship. See the reviews by M. H. Harris in *Journal of Library History*, 13:3, Summer 1978, pp. 367-369; M. E. P. Henderson, in *Canadian Library Journal*, 35:3, June 1978, pp.231-232; and Guy R. Lyle, in *Library Journal*, September 1, 1978, 103:15, pp. 1575-6.

13. "All good workers appreciate that they stand on the shoulders of others. They are grateful for what their more primitive predecessors have done and perform their own tasks more intelligently and efficiently if they have studied the stages in the development of their art." H.M. Cashmore, quoted by Thompson, 1977, op. cit., p.9.

14. Cotterell, A. (1980), *The Encyclopedia of Ancient Civilizations*, New York: Mayflower Books, p. 13.

15. Ibid., p. 18.

16. Ibid., p. 12.

17. Descriptions of the historical periods in this section and the data used in Fig. 2-1 are based on McNeil, W. H., 1953, *History Handbook of Western Civilization*.

18. Richardson, E. C. (1963), *The Beginnings of Libraries*, Hamden, Conn.: Archon Books, pp. 27-33.

19. Diringer, D. (1947), *The Alphabet; A Key to the History of Mankind*, London: Hutchinson's Scientific and Technical Publications, p. 21.

20. Cotterell, A. (1980), *The Encyclopedia of Ancient Civilizations*, op. cit., p. 44.

21. Hessel, A., op. cit., p. 2.

22. Thompson, 1977, op. cit., p. 140.

23. Cotterell, 1980, op. cit., p. 19.

24. Farrington, B. (1944), *Greek Science*, Harmondsworth, England: Penguin Books, v.1, p. 14.

25. McNeil, 1953, op. cit., p. 36.

26. Wright, H. Curtis. (1977), *The Oral Antecedents of Greek Librarianship*, Provo, Utah: Brigham Young University Press, (Foreword by Jesse H. Shera; Afterword by H. J. de Vleeschauwer), p. xxii.

27. Burke, R. A. (1953), *Culture and Communication Through the Ages*. p. 79.

28. Hessel, 1955, op. cit., p. 2.

29. The word 'pergama' in Latin means parchment.

30. Burke, 1953, op. cit., p. 80.

31. Ibid., p. 88.

32. Hessel, 1955, op. cit., pp. 11-12, passim.

33. McNeill, 1953, op. cit., p. 325.

34. Burke, op. cit., pp. 53, 91.

35. Hessel, 1955, op. cit., p. 5.

36. Burke 1953, op. cit., quotes from the Institutes, Book II, Title 1 no. 33-34, AD 533: "Letters are inseparable from, and subordinate to, the substance on which they are written, and become at once the property of the owner of that substance," p. 130.

37. Ibid., p. 151.

38. University College at Oxford University already had a library in 1280, the library of the Sorbonne College had a collection of over 100,000 volumes in 1322, and in the same year there were twenty-eight licensed booksellers in Paris (McChesney, 1984, op. cit., pp. 42, 155).

39. McNeill, op. cit. p. 545.

40. Hessel, 1955, op. cit. p. 48.

41. Malcles, L. N. (1961), *Bibliography*, New York: The Scarecrow Press (translated by Theodore Christian Hines), p. 52.

42. Ibid.

43. Hessel, 1955, op. cit. p. 56.

44. Gabriel Naudé *Avis pour dresser une bibliotheque*, 1627; and its English translation by John Evelyn, *Instructions concerning erecting of a library*, London, 1661, reprinted in 1903.

45. Malclès, 1961, op. cit., p. 70.

46. Ibid., p. 108.

47. Smith, J. M., 1968, op. cit., pp. 171-72.

48. Earlier dictionaries defined 'computer' as a person, but since 1934 the term is used for the machine.

49. Roszak, T. (1986). *The Cult of Information*; *The Folklore of Computers and the True Art of Thinking*, New York: Pantheon Books, p. 104.

50. Hewins, E. T. (1990), "Information need and use studies," *Annual Review of Information Science and Technology* (ARIST), p. 164.

51. Garvey, W. D. (1979), *Communication*: *The Essence of Science, Facilitating Information Exchange Among Librarians, Scientists, Engineers and Students.* Oxford, New York: Pergamon Press, p. 110.

52. Shera, Jesse H. (1972), *The Foundations of Education for Librarianship*, New York, Becker and Hayes, p.107

53. Ibid. pp. 107-108.

# Chapter 3:
# CHANGING PARADIGMS OF LIBRARY AND INFORMATION SCIENCE (L&IS)

## 3.1 Introduction

In this chapter I review major aspects of librarianship as a discipline. And the question I ask is, What were the major conceptual changes in the history of librarianship that affected the formation of the discipline?

Winger summarized major cultural factors in the process of changing the concept of librarianship as follows:

> In its historical context, the role of the librarian has depended on the approach to knowledge . . . Conditioning factors in his task have been the range and complexity of records that were valued by a scholarship and a culture and the size and the differentiation of the audience. The variations in those factors and the personal emphasis librarians have placed on them account for historical changes in librarianship and for the proliferating specializations of today.[1]

The process of the changing conceptual purposes of the library can be divided into five broad categories, as: (a) a storehouse of knowledge in antiquity, (b) a manuscript acquisition in the classical period, (c) a preservation of classical literature by chroniclers and compilers in the Middle Ages, (d) a social agency serving cultural needs of the society in the eighteenth and nineteenth centuries, and (e) a sophisticated technology applied to all aspects of physical library records in the first half of the twentieth century, expanded to cover management of nonphysical contents of the records in the second part of this century.

The discussion revolves around the interrelationships between technical, cultural, and philosophical factors that influence the change. All of them overlap in time and are interwoven in the definition of librarianship.

### 3.1.1 Major Concepts in Librarianship

The cultural needs and technical means for communication shaped the conceptual paradigms of the discipline. Starting at the beginning of human history, the central conceptual notion of knowledge was that of a myth, which accounted for the mysteries of the immediate environment. The myth was explained metaphorically through oral communication based on past experiences, preserved in story-telling. The cave paintings expanded oral into visual communication, expressing human thoughts in the graphic medium of symbolic figures. The pictures impressed on the artifacts become storable. The technology of expressing the symbols in pictographic writing led to the creation of mental images of physical experiences. For the first time, decorative artifacts provided means for describing experiences that could be stored in separate places.

The introduction of the alphabet attached meaning to the signs and facilitated communication through symbols, allowing for more direct and economical recording and preserving of thoughts.

The use of recording material, such as a clay tablet, papyrus, or parchment, introduced the concept of the generic book, which allowed for bringing together different concepts on a variety of subjects. The concept of discourse was introduced.

The need to share recorded information led to the cultural acceptance of copying. This prompted development of duplicating techniques that culminated in the invention of print, followed by electronic reprographic devices. The concept of disseminating recorded knowledge becomes the main function of librarianship.

Social fear of new ideas propagated through print reinforced the need for cultural conformity, introducing censorship that scrutinized written material through content description and indexing of individual books. This is the beginning of the technical bibliography.

Introduction of the machine to augment human muscles led to the industrial revolution's focus on efficiency and effectiveness in the use of resources, and to the development of modern techniques for management of physical resources. A separate library division for technical services emerged.

A humanistic reaction to the economic exploitation of employees stressed the importance of social and environmental factors in production. This new awareness of human factors in service to the patron was expressed first by the "public service" approach, later refocusing on specifically 'user-friendly' attitudes.

Fast-expanding technology and especially the development

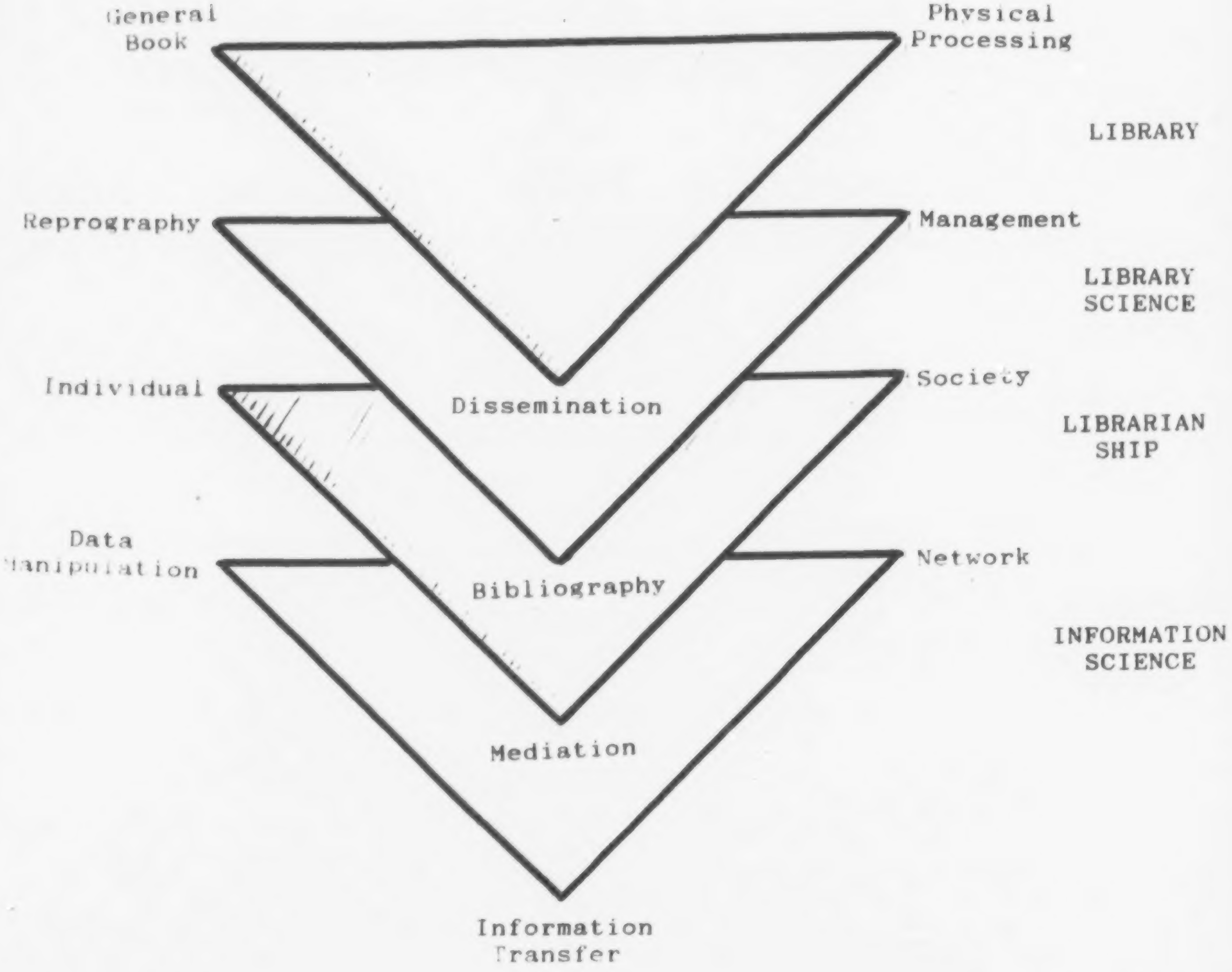
General Book
Physical Processing
LIBRARY
Reprography
Management
LIBRARY SCIENCE
Individual
Society
Dissemination
LIBRARIAN SHIP
Data Manipulation
Network
Bibliography
INFORMATION SCIENCE
Mediation
Information Transfer

FIG. 3-1: EMERGING SUBDIVISIONS OF LIBRARIANSHIP

of electronic computational machines produced the computer and the ability to manipulate the content of records.

### 3.1.2 Four Faces of Librarianship

In the course of the historical evolution of the concept of librarianship, the discipline acquired its four separate but interrelated dimensions as Library, Library Science, Librarianship, and Information Science. They are illustrated in Fig. 3-1 and discussed in this section.[2]

Each of the subdivisions identified in the diagram parallels the cultural changes just described.

a. *Library*: In the first period of evolution, the focus of librarianship was on the process of production, acquisition, preservation, and storage of books. It was the age of the library and librarian as book-keeper, culminating in the emergence of the concept of disseminating the content of the records.

b. *Library Science*: The focus on bibliographic organization of records and advancements in reprography created a need for systematization of practices and for education in the technology of library operations. The theory of library science was formulated around the issue of the management of library resources.

c. *Librarianship*: With increasing demands for library services for individual patrons as well as for society at large, awareness of librarians' social responsibility for their work and their mediating role prompted formation of professional standards. Librarianship became a separate and distinct profession, dedicated to the provision of information, by balancing the individual patron's and society's needs for this profession. This was the phase of the library as a community builder, linking sources of information with people, and it eventually led to the emergence of the global village of library readers, with the library focusing on the communication function of ideas.

d. *Information Science*: The introduction of computers increased the library's ability to manipulate information records and to expand its services through networking. The focus on the process of disseminating the content of the records, independently of its format, introduced the concept of 'information transfer.'

It is worthwhile to note links among the subdivisions (vertices of each triangle in the diagram). They point out the continuity in the development of the discipline.

The high point in the development of each subdivision becomes the focal theme of the next subdivision. Thus, Library's emerged function of disseminating records becomes the concern of Library Science in developing theories about bibliographic organization of records. As an organized system, the Library becomes a profession of mediating between the records and their users. Mediation, as a psychological activity, shifted the attention from physical aspects of information content of records, to the nature of information itself, leading to the emergence of Information Science.

The demarcation lines between the concepts of the Library, Library Science, Librarianship, and Information Science are vague. They demonstrate a lack of consensus, especially in differentiating between Library and Information Science. Protracted discussions and often pessimistic projections of the future role of librarianship, both within and outside the walls of the library, are the results of misunderstanding the paradigms of the discipline.

In this chapter I provide a synoptic description of each subdiscipline's major conceptual themes, as a background for the study of similarities and differences between them in the next chapter.

## 3.2 The Library

Since the beginning of library history until recent times, the predominant focus of librarianship was on the book, its physical aspects, and its format. The main objective was to acquire and store books for their immediate and future use. The outward image of the discipline was the library building and its physical content. The discipline was associated with, and named after, the library.

The term 'library' initially stood for reference studies and services. In the nineteenth century, the definition was expanded to include the building and its collection. Later, the term was used for the institution responsible for the management of the collection, represented by different types of libraries, each administering its services to different clienteles. [J.K. Gates, 1976]

H. Arntz (1983) reviewed various theories about the emergence of man, arguing that the most important stage in that emergence was the process of acquisition, storage, and conceptualization of information. In his study, called a 'palaeology of information,' Arntz maintained that information pressure, initiated by the need for survival, created craving for adequate new information. 'Being informed' counteracts natural laws of Darwinian selection. This basic, almost biological need for information is reflected in the expanded individual human brain's storage capacity, while the society's response to the aggregate information needs led to the creation of the concept of Library.

### 3.2.1 Changing Library Image

The evolving nature of the Library as an institution is characterized by a gradual change of its organization. The change itself was prompted by the changing format of records stored in libraries: from clay tablets, to papyrus, to parchment, to paper, to nonprint and electronic data.

The fact that the improved physical formats of records made them more transmittable facilitated their use, and demand for books increased significantly stimulating production of new records. At the same time, however, the new formats became less permanent, requiring special preservation procedures for original records and new technologies for their reproduction.

The concept of the completeness of a collection and expanded acquisition activities in the Assurbanipal Library were reflected in the constant demand for a variety of clay tablets. Papyrus made copying and translation of documents possible, while parchment added portability to books, which were soon used for everyday, inspirational purposes. The new format facilitated the use of books in cathedral schools and in the scholarly pursuit of knowledge in colleges. In the fifteenth century mechanical printing allowed for inexpensive multicopy reproductions of an author's works. The rapidly expanding utility of books created, in turn, a need for improved management of records, leading to classificatory systems, cataloging rules, and bibliographic control. Technological changes continued at an accelerated rate, introducing multiple media, such as microformats, nonprint disks, electronic data files and optical storage disks. New information formats require specialized knowledge for managing the records contained in them and for providing reference services to use them.

The preference for new book formats was not always the immediate reason for accepting technological change. For example, Anderson questions the belief that codex owed its existence to the substitution of vellum (parchment) for papyrus, as a strong material that allowed for writing on both sides of the page. Actually, papyrus was also sturdy, durable, and flexible and was used for a long time interchangeably with parchment in rolls and codexes. [Anderson, 1988]

Anderson argues that the use of codexes grew slowly. In the first century A.D. less than one percent of manuscripts were codexes; in the second century their number increased to two percent, and to three percent in the third century. It was not until the fifth century that most (90 percent) of manuscripts were codexes. However, among Christian biblical manuscripts 91.9 percent were codices in the first four centuries; by comparison, 91.1 percent of manuscripts used by Greeks were rolls. The ratio of rolls to codices in the first four centuries B.C. suggested to Anderson that the book form was introduced primarily to distinguish Christian writings from those of Jewish and other religions' literature.

It was not, therefore, exclusively the technical innovation in writing material from papyrus to parchment, nor the physical shortcomings of the roll, which led to the discarding of papyrus and a change from roll to codex form, but a cultural environment. Anderson reminds us that it took 300 years for people to become sufficiently convinced of the physical advantage of the book format that it was accepted by other cultures.

Another important factor in library evolution was the economics of the book market, determined by the availability of recorded information. In the medieval era, books were purchased from peddlers, an unreliable but popular source for providing forbidden books. Book loans became the substitutions for expensive ownership of books, which was limited to privileged classes. The concept of book-lending was instituted by a stationer as an authorized source for rental and purchase of manuscripts. An increased demand for books among the people of the middle classes expanded copying and manufacturing activities. The growing number of printed books at a lower cost led to the organization of printers' guilds aimed at the protection of their trade and their staple, the limited editions. Availability of book replacement made 'catenati' (chained books) unnecessary, while sturdy binding changed storage methods, from flat to upright shelving, and at the same time improving browsing. The multiplicity of subjects published prompted philosophical 'mapping' of knowledge into classes, and the development of the science of classification followed. Finally, duplication of copies replaced exclusive ownership of books by members of royalty, nobility, and religious orders by creating public ownership of printed material.

Recent technical changes in library operations caused some confusion in interpreting the library's new social role. The traditional view that librarians are agents of culture (Burke, 1953) and missionaries of values (Gardner, 1964) was considered by some reformers out of step with social changes. Yet the requirements of change are ambivalent; in an age characterized by specialization, librarians are expected to act not only as generalists but also as humanists to compensate for the impersonal, automated library in an age of mechanization, and as individualists in an age of conformity (Harwell, 1960).

Others see Library as a system for assembling records, for developing and disseminating information services, which are open to environmental influences and human interaction (McMahon, 1977); or as an information system generating, collecting, storing, manipulating, and delivering data and objects (Heiliger, 1971). The original simple mission to acquire and organize books is now expanded to other information resources not found within the traditional library.

With the anticipated disappearance of the traditional library by the year 2000, few institutions will act as passive archives of printed material. The focus will have to change from the physical library to the librarian as information specialist, free from association with a particular building or collection. Nevertheless, the library will always retain two primary functions: as a repository of recorded history, and as a communication agent (Oboler, 1976), modified by a changing external environment. Hence, there is a need for historical perspectives in understanding these changes (Robson, 1976).

Furthermore, the library's future depends entirely on public demand for its services. Thus, in times of change, 'selling' the library mission to its patrons is a prerequisite for survival. It can be accomplished only by close contact with library users, through better service and intelligent public relations programs.

### 3.2.2 Evolving Library Objectives

Library objectives always closely reflected societal and cultural needs of the period. The table below summarizes the evolution of library goals, their implementation, and the societal reaction to them.

| Objectives | 17-18 c. | 18-19 c. | 19-20 c. |
|---|---|---|---|
| Goals | To read | To educate | To mediate |
| Policies regarding information | Availability | Usefulness | Availability & Usefulness for diversified purposes |
| Major Activities | Storage | Internal organization | Cooperation between libraries |
| Public reaction | Toleration of library | Acceptance of library | Participation in activities of library |
| Library's perception | Ornament | Utility | Tool |

FIG. 3-2: The Evolving Objectives of the Librarianship.[3]

The overall pattern of library objectives emerged in a pre-modern period with the focus on physical records, books. The scope of librarianship gradually enlarged into an educational and mediative role for the library as a cultural unit serving society as a whole.

In the period of cultural enlightenment, library involvement in the affairs of its community began with emphasis on the value of reading for its own sake. It was extended to the humanistic notion of the individual patron's self-improvement, which would, in turn, strengthen the general will of the society. The library's goal was to encourage reading, especially of 'good' books.

Changes in library technology reflected the philosophy of the industrial revolution based on the faith in science and technology. A continuous focus on reading as a cure for social maladies was reaffirmed, based on a belief that all social problems were caused by violation of the laws of nature. The library was expected to educate its patrons by selecting books best suited to their needs.

Contemporary preoccupation with multiculturalism in democratic systems explains library relativism in both its politics and philosophy. It calls for a complete involvement of Library as a social institution in the affairs of the society to assist in minimizing ensuing conflicts between group interests.

The library is expected to mediate between the often-conflicting needs of different groups within the society, by balancing its collection so that opposite views of issues of interest to its patrons are available to them. [Fig.3-3]

Library patrons' pressures on the library take the form of threefold requests: (1) for service, to provide requested material (patron knows what he/she wants), (2) for education, by providing instruction to identify material on a specific subject (patron wants to know what record he/she should consult), and (3) for arbitration, asking the librarian to select among alternative materials.

The library as a social institution cannot ignore or succumb to any single public interest pressure, but response to such pressure, in and of itself, is a *sine qua non* of library existence. It has to be incorporated in any library theory. Its practical application implies an active participation in the affairs of its community, not only in response to pressures, but also in imposing on society its own pressures for resources and rights for serving, educating, and mediating public interests of the society.

On the premise that knowledge is power, some librarians argue for a library role as an agent of change, aggressively imposing the library's preferred ideology on the community by manipulating library resources toward that end. Recent attempts in this direction have failed, and will probably continue to fail until the

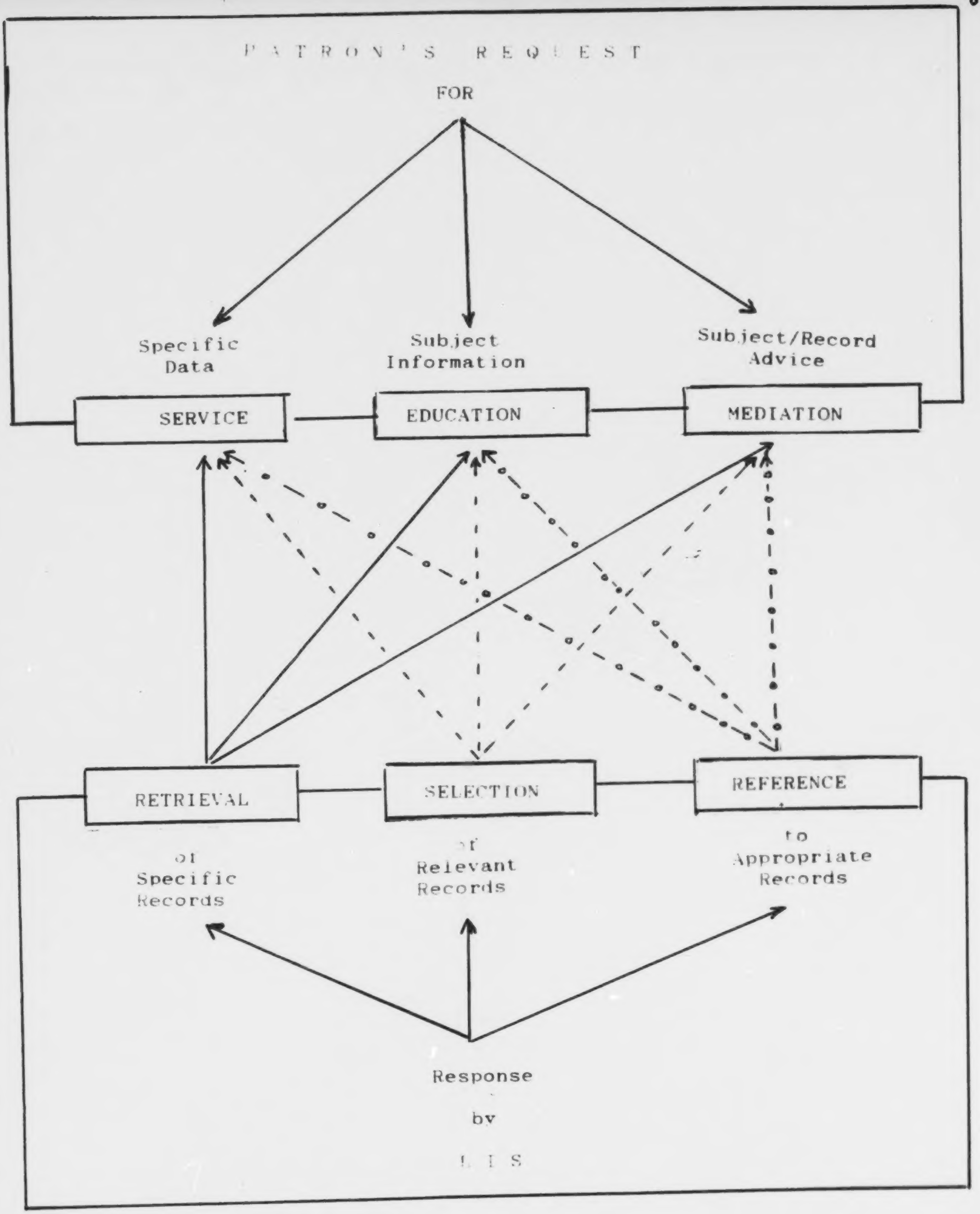
PATRON'S REQUEST
FOR
Specific Data
Subject Information
Subject/Record Advice
SERVICE
EDUCATION
MEDIATION
RETRIEVAL
SELECTION
REFERENCE
of Specific Records
of Relevant Records
to Appropriate Records
Response
by
L I S

FIG. 3-3: RELATIONSHIPS BETWEEN PATRONS' NEEDS AND LIBRARY PROFESSIONAL SERVICES

BEST COPY AVAILABLE

society develops a consensus on a desirable information ideology. The philosophical question is how to verify the value of the change before it takes place.

A corresponding focus in library philosophy is reflected in the metalibrary model which identifies the main dimensions in interpreting the library intellectual environment: (a) the procedural approach reflects the heritage of the age when science was preoccupied with improving the physical aspects of human conditions; (b) the contextual approach stresses the problem-solving methods reflected in the contemporary philosophy of relativism; and (c) the conceptual approach, developed in the historical period of great optimism and faith in human potentialities, focuses on integrating library activities with the needs of its environment. By interrelating the above three approaches, the library can fulfill its basic function of providing a proper intellectual environment for the total community of its users.

Hence the philosophy of librarianship emerges from the general philosophy, as a unique expression of intellectual environment developed specifically for an individual library patron's independent interpretation of reality through recorded knowledge.

## 3.3 Library Science

In his essay on the origin of Greek science, B. Farrington reminds us that science started in prehistoric times as a result of efforts to master the environment. It "has its origin in techniques, in arts and crafts . . . its source is experience, its aims practical, its only test [was] that it works."[4] This empirical and fragmentary knowledge was synthesized into a theory by early Greeks, making science "a logically coherent body of knowledge deduced from a limited number of principles."[5] But the main unifying characteristic of science is its affinity with the culture in which it is developing. "There is no such thing as science in vacuo. There is only the science of a particular society at a particular place and time."[6]

The origin of science is traced to pattern seeking. Patterns are "any sequence or arrangement of events in time or any set of phenomena in space so ordered as to be distinguishable from, or comparable to, any other sequence, arrangement or set."[7] For example, the pattern in astronomy is a pattern of night and day, in physics, Newton's pattern is mutual relations of physical bodies; in biology, Mendel's theory of heredity is pattern-driven, and in librarianship, 'difficult reading' implies a difficulty in reconciling patterns between text and the reader.

Library science is often defined as a theory of library practices. With the increased complexity of library operations a need emerged for a theory to guide these operations. Librarianship is considered 'scientific' both as a method and as a subject domain. A constantly changing library environment modified the technology of its operations. Library science emerged from the accumulation of techniques, by responding to the social need to codify its processes. Hence library science is here identified with the changing technology.

C. H. Rawski argues that in order to know, we structure. For the medieval scholar the logical order 'imposed from without' had become the property of the system, reflecting coherence and interdependence among different disciplines. The objectives of a scientific discipline are expressed in its definition, which, in turn, influences new inquiry within that definition. We cannot arbitrarily decide where and how to delimit a field (Rawski, 1973).

Library science, as a science, is conceived as a conscious collection or acquisition of data interpreted by means of definition, analysis, and classification (Mukherjee, 1966). More specifically, it is a systematic study of relationships between bibliographic and informational aspects of knowledge, expressed in principles and laws that govern observable patterns.

### 3.3.1 Its Origins

In the beginning, the library was both a passive storehouse and an active publishing institution. Each function required technical 'know-how' and instruction. The Assurbanipal Library employed scribes and scholars to edit, revise, and copy texts. Medieval monasteries kept scholarship and books alive in libraries and scriptoria throughout the Dark Ages. Abbot Theodore of Studium set up regulations for the operation of scriptoria, Cassiodorus established the first separate scriptorium in Calabria (Vivarium) and wrote the often-replicated rules for the monastery and its library.[5]

The very close connection between libraries and book production ended with the invention of movable type. From then on, the library's major contribution to the book industry was the bibliographic control of published material by producing printed catalogs and booklists, microfilming newspapers, and collecting recorded music and videotapes. With a new technology, however, librarians may be back to doing some form of publishing work: scanning documents into electronic format both for preservation and for dissemination purposes.

### 3.3.2 Its Scientific Character

The scientific method defines necessary procedures in the process of formulating relations. Librarians, similarly to any other scientists, collect and interpret data in terms of their relevance, arrange and classify them within a selected system, and verify the results in actual library practice.

Bibliography, classification, cataloging and reading are the four traditional subject matters of library science. They include processing, preserving, and storing carriers of information; selection and organization of resources; content analysis, indexing, retrieval, and bibliography. Librarianship studies the dissemination of the content of library collections to its patrons through direct circulation, through indirect loans, and through network sharing of resources. Finally, library science focuses on the management of library operations that include issues relating to the physical plant, staff administration, political environment, and resources (budget, etc.).

The beginnings of the development of modern library science can be traced to 1627 and Naudé's writings on the management of library collections. Initially, the focus on the emerging science was not on the discipline itself, but on the library. Naudé in his *Avis pour dresser une bibliotheque* (1627), the first textbook on library management, discussed practical aspects of library organization, such as convenience of use, hospitality and the simplicity of library operations rather than their philosophical rationale.

Naudé was also the first writer to recognize the librarian as a specialist in handling sources of information. His view reinforced the then-accepted role of librarians as scholars and bookmen. It was not until the nineteenth century, when librarians like Martin Schrettinger began talking about the discipline of library science, focusing primarily on the history of books (F. A. Ebert).[9]

The first known library course was offered in 1886 by Karl Dziatzko at the University of Göttingen. Library science was then considered an auxiliary discipline (paleography), preparing students for scholarly libraries (Hessel, 1955). The first library school in the United States was introduced in 1887 by M. Dewey at Columbia University; it focused on public library practices such as filing, shelving, and handwriting. In 1927 the Graduate Library School at Chicago (GLS) introduced its own sociological framework, with some probing into the philosophy of librarianship. It was the first library school to offer a Ph.D. program. On the other side of the Atlantic, British systems offered a program that compromised between the practical and scholarly approaches.

The major dimensions of library science are scientific, sociological, psychological, and applied (Butler, 1933), involved in collection, organization, and supply of intellectual resources, regardless of physical form or purpose (Shaw, 1967). Ortega y Gasset (1961) identified three stages in the development of the discipline: (1) in the Middle Ages, the socialization of the book resulted in the expansion of its production and acquisition, (2) in the nineteenth century, with a wider acceptance of the book, the library was recognized as a public function, and (3) after 1934 the book became central, living function of the library. This was accompanied by the change of the name of 'Library Economy' to 'Library Science,' the term which today stands for library technology or engineering. The theoretical orientation shifted from scholarship to technological interest, weakening the public image of librarians [A. Khurshid, 1976].

### 3.3.3 Bibliographic Aspects of Library Science

The bibliography developed as a tool to locate needed information rapidly and accurately. At first, its scope was limited to the records available in a specific library, later it extended to library networks.

The development of bibliography parallels the emergence of library science described above. It began by providing statistical data about publishing activities. During the fifteenth to sixteenth centuries, the bibliography was enumerative, with bibliographic scholarship concentrating on the history of publications. In the eighteenth century it developed into a science of paleography, deciphering ancient manuscripts. In the nineteenth century bibliography became a science of the book in all its forms, covering classification of knowledge and books and identifying library science with bibliography and book production. In 1934 bibliography returned to its original role: compiling lists of books and tracing their creation, purpose and distribution [L. N. Malclès, 1961].

Today, bibliography includes the history, physical description, comparison, and classification of information-related records (print and nonprint). Initiated as an enumerative bibliography in antiquity, it evolved into descriptive classification (e.g., Dewey's system), analytical bibliography (e.g., Ranganathan's Colon Classification, 1963), applied theory of bibliographic organization, and subject specialization reflecting the specific needs of different institutions.

It is important not to confuse a descriptive bibliography with a catalog. A bibliography compares each like object as a separate entity, while a catalog of a collection compares individual items as part of an assembly of records, from one source only.

The roles of bibliographers and historians are closely related. As noted by M. A. McCorison (1984), the historian is concerned with the content and the meaning of the recorded evidence, while the bibliographer takes the same evidence and interprets its impact on readers' perceptions of the content and its meaning. The historian focuses on the annotated bibliography, with no regard for its physical format; the bibliographer provides a physical description and the content of the source. A bibliographer's task is to explain to the potential user the significance of a particular publication, thus bridging the gap between librarians and historians. To quote Goethe, "without libraries there would be no history."[10]

### 3.3.4 Classification and Cataloging

The bibliographic, cataloging, and classificatory functions of library science are closely interrelated. A need for improved access to the collection resulted in the emergence of library catalogs (AD 700), and the increased subject matter of the records prompted development of classification and the use of classification symbols. The first known classification dates back to AD 281 in China. Modern classification began with Cassiodorus in AD 550, and with Roger Bacon in 1266. Francis Bacon's

*Chart of Human Learning*, published in 1623, influenced several modern classification systems.

To classify means to arrange objects into groups according to common characteristics, leading to a classificatory science. The essence of all classification systems is to indicate all subjects referenced in any given document, and to identify all documents referred to a given subject.

Subject classification aims at dividing total knowledge into subcategories; a 'classed catalog' consists of subjects listed alphabetically. Additional alphabetical classification by author was introduced to accommodate changing subjects.

Until the nineteenth century, library classification followed the classification of contemporary philosophy. The eighteenth century was an age of systematization; in the natural sciences various species were arranged into classes by mutually shared characteristics, and newly discovered objects were described in terms of these classes. After the nineteenth century, knowledge was divided into levels, and each level into topics, listed in some order (D. J. Foskett, 1964). Contemporary classifications focus less on formal logic and more on anticipated use of material, as opposed to a previous metaphysical approach (M. F. Winter, 1988)[11] Yet, classification involves a practical question: "by what principle should books be physically placed relative to one another in linear continuity upon shelves?" This then is "transformed . . . into a rather sophisticated metaphysical problem . . . [involving] both an elaborate theory of reality and theory of knowledge."[12]

Following this principle, E. E. Graziano analyzed the influence of Hegelian philosophy of reality on modern classificatory schema. He concluded that Harris and Dewey systems are both based on the Hegelian logic of dialectical forms of knowledge and reality, and only superficially relate to Francis Bacon's *Classification of Knowledge into Memory, Imagination and Reason* and its subdivisions.

Grazianno writes, "The forms of knowledge, analytic and synthetic, are identical with the forms of objective reality . . . but the dialectical forms of knowledge always move in opposition to their corresponding dialectical forms of reality. Knowledge, as synthetic, can only apprehend the universe in its diversity. Conversely, knowledge as analytic can only understand a synthesized universe."[13]

Winter divided classification of library material into three groups.

(1) Deductive classification goes from general to specific subjects, such as Dewey's deductive classification system. Stiles proposed to decrease specificity in the classification of library material, which would lead to the increased probability of its retrieval, arguing that the more specific the subject, the less frequently it occurs. However, this is more true of books than documents, since most periodical articles are on specific subjects.

(2) Inductive classification is based on generalized principles. Ranganathan's classification consists of intuitive principles referring to absolute categories. Facet classification arranges phenomena by homogeneous categories (facets); within each main class, facets are arranged by personality (product), matter (raw material), energy (processing operations), space (geographical subdivisions), and time (chronological subdivision). The categories are arranged in some sequence with notations allowing for combining items from different facets. This arrangement reflects the actual reader's approach to library material.

(3) Pragmatic classification, such as Library of Congress classification, adjusts to changing the paradigm of knowledge, For example, Vickery's categories are based on explicit analysis of subjects. His method consists of (a) examination of literature to enumerate subjects of each article (e.g., substances, products, parts etc.); (b) arrangement of these subjects as categories in order of importance to the subject (facets); and (c) enumeration of individual items in the content of the facets (Winter, 1988).

Ward focused on two philosophical issues related to classification theory. The first was a metaphysical issue of the kind of reality of the objects classified, their status as real or fiction. The second issue related to the epistemological nature of the definitions of the concepts that denote the classified objects. Thus these questions arise: "Are we to understand definitions as assertions which give descriptions of objects? Or should we take definitions as imperatives which prescribe rather than describe linguistic practices?"[14]

A. Broadfield pointed to the major issue in classification that directly relates to the interpretation of reality, discussed later in this book. "The problem of the theory of classification is that of discovering the logical bases of the various kinds of kinds, of which some are known *a priori*, while the knowledge of others is changeable according to the results of research. One step towards a clearer understanding is made when we distinguish between the characters of things and the things whose characters they are." [15] As he noted, the characters of the things are easily confused with the things they characterized.

### 3.4 Librarianship

The suffix '-ship' in any word denotes a condition, an office, or a profession; thus it defines librarianship as an office, duties, or profession [Gates, 1976].

#### 3.4.1 Gradual Development

Librarianship as a profession was formally launched at the first national library conference on October 6, 1876, in Philadelphia. In that year the American Library Association was organized, the Library Bureau of ALA was established, and the first official survey of public libraries was included in the *U.S. Bureau of Education Special Report.*[16]

Historically, professional controls of library activities developed gradually. Prior to 1876, the place of the librarian in society and his control over his activities varied. In antiquity the librarian was a member of a privileged group, an educated scribe-priest, a polylinquist, and subject specialist serving as an advisor to those in power. In the Middle Ages, librarians fell from grace, performing the purely technical work of scribes and copyists. The social mission of librarianship emerged in 1876 and changed again the status of librarians. The new role was fortified by an introduction of technology specifically designed for library processing of graphic records, thus separating librarians from other professions as a unique group [Thompson, 1977]. Professional library organizations strengthened the status of librarians by certifying membership in a group based on specific educational standards.

### 3.4.2 Major Changes in Library Functions

Before the introduction of the Uplift Theory (pre-1900), librarians were exclusively interested in the content of books. A major shift began in the 18th century, following a change from a rational and individual to a collective philosophy; individual consciousness was gradually replaced by group consciousness, changing 'I-awareness' attitude to one of 'we-awareness' [P. Karsted, 1954].[11] This shift marks the beginning of modern librarianship.

Today, Librarianship is seen as a professional organization that processes and facilitates access to and use of information (M. Kochen, 1983), provides means of communication between knowledge and people (Line, 1968), and mediates between different needs. "Mediation among records and users requires, in addition to communication, the ability to abstract the formal properties of documents from their contents . . . the interpretation of the content of the record is secondary to the organization of bodies of records by formal characteristics." [18] As a discipline, Librarianship cannot be fully explained in terms of itself alone (McGarry, 1975); it is defined as a process with social aims (Foskett, 1962) and, especially in public librarianship, as a social institution transmitting culture (Martin, 1937).[19]

The Library of Congress in the United States and the British Museum in England contributed significantly to the popularization of the book, its content, and the library profession. The two national libraries provided limited public access to records, employed scholars to organize the collections, developed public catalogs and cataloging rules, and became legal depositories of books published in their countries.[20]

The emergence of public libraries followed. Special services were offered on both continents by providing, for example, new formats such as books for the blind (e.g., Braille, known as 'Gutenberg of the blind,' with his raised dots), talking books, and video books. The more recent concept of network approach to resource sharing was facilitated by online processing, reference, and retrieval of material.

### 3.4.3 Different Views of Librarianship

Approaches to a profession in general are expressed by three different theories: (a) the 'trait theory' considers a profession as an occupation with certain identified characteristics; (b) the 'functional theory' defines the profession as a process; and (c) the 'political theory' considers a profession as a control factor in the society (Winter, 1988).

Butler (1951) distinguished three corresponding phases in librarianship: awareness of scholarship and responsibility of the librarian as a bookman in the 1850s, preoccupation with technical issues in the 1870s, and self-consciousness, awareness of social concerns, and cultural environment in the 1920s. Butler's and his colleagues' contributions at the University of Chicago Graduate Library School led to the emergence of a philosophy of librarianship.

Functionally, librarianship is defined as "that branch of learning which has to do with the recognition, collection, organization, preservation, and utilization of graphic and printed records."[21] And in the case of a university library, its primary function is "to secure, make available, and conserve the materials of research needed by members of the faculties and graduate students."[22]

Historically, librarianship is closely related to scholarship in its pursuit and control of knowledge records, requiring bibliographic training and skill to organize and service written records (Bay, 1941). Scholarship itself is a system of ideas, facts, theories, and opinions. True library scholarship integrates science and technology with humanistic perspectives relating to the individual patron and his social group (Butler, 1951). Today's focus in librarianship, however, is more on the process (research and education) than on cultural functions (philosophy of librarianship).

C. S. Thompson (1931) objected to the 'unrestrained' scientific and research orientation as weakening the traditional focus on reading. J. P. Danton (1934) pleaded for the philosophical viewpoint, arguing that science deals with acquisition of data, their description and explanation; while philosophy is interested in the aims, functions, purposes, and meaning of librarianship. Although all writers agreed on the social function of the library, there was no consensus on its specific duties or functions; some advocated a passive role, such as serving readers only when they asked for help, others wanted an aggressive approach. The lack of philosophy affected the sociological foundation of librarianship (Khurshid, 1976).

J. Thompson (1977) defined the library profession in terms of his seventeen 'principles,' discussed in the previous chapter. They included library dependence on society, its unique monopoly in preservation and maintenance of free access to all knowledge; its educational role in adjusting library collections to cultural environments; and pragmatic management of libraries by professional librarians.

B. P. McCrun described the characteristics of librarianship in terms of its 'idols' of prejudice, error, and misunderstanding (McCrun, 1946). S. Rothstein added its ethos: values of reading, taste, intellectual freedom and professional skills (Rothstein, 1968).

Kaser proposed an anthropocentric view of 'Bibliothecalhood.' As the library's stewards, librarians are responsible for preserving, organizing, and disseminating the humanistic message. "Unless we do our work well as librarians, we could bring about the destruction of our society as the Mayan priesthood may have done in Yucatan."[23]

Harris criticizes the adaptation of pluralistic paradigms in librarianship, which portrays the profession "as apolitical servants of the 'people'. . . completely neutral on social, economic, and political questions -- a passive 'mirror' of societal interests and values." [24] This, according to Harris, leads to technically sophisticated but also trivial research in librarianship, research which "has dictated long and broad structured silences relative to the ways in which social, economic, and cultural power relations shape the nature and extent of library service in America." [25]

In his own theory of library service in the United States, Harris focuses on librarianship as a consumer of culture, rather than a producer of its circulation: "Libraries are marginal institutions embedded in a hierarchically arranged set of institutions designated to produce and reproduce the dominant effective culture in print form . . . with some like publishers and reviewers, empowered to create and produce cultural products, and others, like librarians, limited to the transmission and reproduction of the dominant effective culture."[26]

In this view, library reality is determined by the political and economic powers outside the discipline, which "determine the nature and extent of the knowledge forms we acquire, preserve, and disseminate."[27] It also "challenges the 'apolitical' conception of the library . . . and strips the library of the ethical and political innocence attributed to it by the pluralistic social theorists."[28]

### 3.4.4 Ethics of the Profession

In general, professional ethics stresses either traditional, often negative, restrictions imposed on a discipline, or idealistic viewpoints, advocating positive rights and freedoms to expand the discipline's activities. This dichotomy is related to two types and three kinds of professional autonomy.[29]

The two types of authority are (1) normative, based on shared values, and (2) structural, based on legal power of the organization. The three kinds of autonomy determining the values and principles of professional conduct are: (1) practical/political, (2) philosophical/intellectual, and (3) moral.

In the past, the normative authority of librarianship reflected that of its society; its structural authority was severely limited by imposition of society's own values, affecting both the political and professional autonomy. Today, most library professional work is collegially controlled.

One of the themes of this book is the articulation of the library's philosophical and intellectual authority, which may in turn strengthen its moral authority for determining the bibliographic value of specific information.[30]

### 3.4.5 Reading

Promotion of reading is one of the most visible educational activities of librarianship. The impact of reading on an individual reader and its relationship to reading environment are the subject of the sociology and psychology of reading. The now well known questions 'who reads what, why, on what level of reading, and where does he or she get it ?' are the subjects of reading research. The major issues include motivation, use, function and values of reading. "The process of reading effects is not one-way transference, from books to readers, but . . . it entails a reaction, certain elements in the reader responding to certain elements in the reading to produce an 'effect'"[31]

It is important for librarians to know the kind of reading needed and how to facilitate it, by assisting in the process and by providing appropriate reading material. Each book is a specific interpretation of reality and the librarian's assistance in its selection is based on the aggregate understanding of book-reader relationships (MacLeish, 1972, 1976). Library leadership in promoting reading is based on a belief in readers' receptivity to the book's content, and their broad-mindedness (Haines, 1938).

Reading research in librarianship "reveals much about the basic nature of the library profession and the social, political, and methodological problems librarians face . . . for example [it] concerns the fundamental question of whether librarianship is (or should be) essentially a social science, an art, a craft, or a technique."[32] In his extensive study of reading research in pre-1940 librarianship, S. Karetzky pointed to the significant relationship among the researchers' philosophy of librarianship, their use of research data, and their social environment. His research adds an intellectual and philosophical dimension to librarianship. According to Karetzky, the basic functions of reading are: (a) to learn about known reality (i.e., reading for information), or (b) to escape incompletely known reality (either as a metaphysical search for knowledge, or as a recreational activity).

People vary considerably in what motivates them to read. Some read for aesthetic purposes, to appreciate somebody else's interpretation of reality, whether imaginative or empirical. Devotional reading is motivated by spiritual, emotional needs, while cultural reading aims at enhancement of one's status, or as a goal in itself (Mukherjee, 1966). So-called 'good reading' always reflects the personal needs and taste of the reader.

The level of reading and the librarian's assistance to readers in their personal development through reading are determined by the relationship between the book's format and subject content, and the reader's interest and background.

Two metaphors concerning reading were used in 19th century library literature (Ross, 1987). (1) The 'reading as a ladder' metaphor suggests that books can be objectively ranked on a scale of quality from low to high, and it is the duty of the reader to climb the reading ladder. This approach repudiated fiction and reading for pleasure as inferior to the reading of nonfiction, or for information. (2) The 'reading as eating' metaphor shows that the real content of a book is a thing that can be swallowed and will have predictable effects on a reader.

The treatment of fiction in the 20th century suggests that the metaphors of 'reading as ladder and as eating' have prevailed until now. Some people feel that reading for information is nobler than reading for emotional experience. Yet it is the intellectual process in the use of the library by the patron, rather than the way individual books are read, that ought to be of primary concern to the librarian.

Both metaphors provided a rationale for expanding library policy: to provide assistance and access to collections as basic library functions, and to include intermediary service between the content of the book and the reader's needs.

In the past, many writers commented on the importance to the library of reading. Jefferson argued that reading provides for self-education, freedom, equality, and achievement. To Butler, civilized man writes books for two reasons: to express his feelings or to record information; and he reads works of others "for the emotional experience or to acquire information."[33] Bostwick, Putnay, and Richardson see librarians as agents of the book. MacLeish feels that the book is not merely a physical but also an intellectual object. It contains reports relative to the mystery of existence and the reporters' interpretations of it, and it offers material for synthesis of universal life experiences, expressing reality beyond the self. The library provides access to such experiences (MacLeish, 1972). To Powell (1954), the good book is a 'teacher par excellence.'[34]

## 3.5 Information Science

Information science evolved from the earlier movement of documentalism. Shaw, Taube, and Shera, the three early proponents of the movement, agreed that a documentalist differed from a librarian in two ways, by providing greater intensity of search and by better subject knowledge (Mohrhardt, 1964).

Basic questions asked by information scientists are: What is the information wanted for? What is the meaning that must be extracted from it? What knowledge is required for effective and competent action? These questions represent a major shift from the traditional focus on the generic book content to the more general concept of information as a structure of any text (Belkin, 1978).

Definitions of information and information science vary and are discussed in more detail later in this book. To illustrate their variety, here are some examples.

(a) On information.

The word 'information', standing for 'action of informing' has been in use since the 1380s; it was first interpreted as 'communicated knowledge' in the 1450s (Lancaster, 1992).

Cooney (1987) suggested four approaches to understanding the value of information: as an intrinsic quality, as a cost, as an actual supply and demand for information, and as a function of utility served. In answering the question 'What should a science of information be?' Otten (1974) lists three levels of information: structural, analytical, and semantic. He considers the concept of information as a code, statistical data, or transfer of meaning, all related to matter, energy, and communication processes (Otten, 1974).

Debons sees information as (a) a process, (b) an altered state, (c) a commodity, and (d) an environment of people, equipment, and procedures. Information bridges the above approaches by metascientific laws.[35]

Information is considered to be an essential component of human life (Curras, 1984). It is defined in terms of decision making, and it provides the bases for a metascience of information, informatology (Otten and Debons, 1970). Or, it is interpreted in terms of uncertainty involved in decision making (Whittemore and Yovit, 1973). Belkin and Robertson (1976) define information as a structure of any text that can change the recipient's perception. They consider text as a collection of signs purposefully structured by the sender. Farradane (1976) identifies information with the text itself, "i.e., as any representative or surrogate of knowledge or thought."[36]

Fox (1983) stresses the everyday meaning of information and advocates a linguistic approach. Dervin (1976) discusses information affecting the 'average' individual, while Wersig and Windel (1985) focus on information action. Buckland (1991) provides a threefold definition of information: as a process, as knowledge, or as a thing. Wersig and Nevelling (1975) believe that information science must be defined in relation to the information needs of people involved in social activities, either as a process of reducing uncertainty caused by communication data, or as data themselves, which are used in reduction of uncertainty. The subjective nature of information was discussed by Popper, Dervin, Belkin, Ranganathan, Jason, Taylor, Cutter, Dewey, and Neill.

(b) On Information Science.

Information science is perceived as an interdisciplinary convergence of communication, instructional technology, and librarianship (Jackson, 1984), which, together with logic and philosophy, deals with relevance of information. It is a study of information production in any information system and it becomes an integral part of library education (Hayes, 1969).

Information science is often defined as a study of the theoretical issues relating to the content, storage, retrieval, and transmission of information messages. Changing needs of science and business prompted changes in information functions, such as translation, abstraction, indexing, system design, and information-related language analysis. The expanding scope of information science is evident in the increased research of physical carriers, psychology of users, sociology of the environment, linguistic nature of recorded symbols, and statistical models of interpretation.

Pratt considers the collection, preservation, organization, and dissemination of records (his 'CPOD system'), as equally applicable to library and nonlibrary situations, and calls for more emphasis to be put on the information system's behavior (Pratt, 1982).

J. A, Pickup distinguishes between information technology and information science, suggesting a change of the name 'storage and retrieval' into 'science of information use', and he stresses the importance of intellectual processing of information (Pickup, 1987).

The trend now seems to be to interpret information science as a process rather than as a product, to focus on conceptual and economic values of information.

### 3.6 Changing Paradigms of the discipline.

The paradigms of library and information science can be delineated in terms of the sociological, philosophical, and scientific aspects of the discipline.

### 3.6.1 Sociological aspects: Society and its expectations.

As an effect and not a cause of societal changes, librarianship is subjected to continuous modifications of its functions and purposes, with little if any control over them.

Development of libraries is also directly related to the level of the country's socioeconomic status; its dynamism depends on the librarians' reactions to societal changes and the way they address the conflict between the needs of individual patrons compared with those of the society. The social responsibilities of librarianship, in order for it to be effective, entail continuous dissemination of knowledge. The library therefore serves as an intellectual node for interdependence of the society's members.

The changing focus of library and information science, from an individual to a society, reflects changed focus in the society itself. The concept of the 'social library', introduced by Benjamin Franklin in the 18th century was based on society's belief in self-education of its patrons. Jefferson called for equality and achievement through reading. The 19th century introduced the concept of libraries for moral betterment. Twentieth century librarianship aims at the provision of needed information to different clients, with the public library concentrating on free access through outreach programs.

In the early 1920s the discipline witnessed expansion of qualitative objectives. During the Depression in the United States, librarians scrutinized their own services in terms of their usefulness. During World War II and its aftermath, the focus was on efficiency of operations, followed by a period of concern about library effectiveness. In the early 1980s the library was criticized for the predominance of its socially oriented programs.

### 3.6.2 Philosophical aspects: Information environment and its nature.

Khurshid (1976) maintained that the functions and practices of librarians are not governed by any accepted principle or philosophy.[37] He implied that philosophy may identify these basic principles by developing philosophy-based models.

By organizing records, we in fact organize the thought processes of the society. The alphabet as a product of ideograms reflects the evolution from ideas expressed by one person, as an artist drawing a picture in a cave, to community-communicated ideas, expressed in common language.

Khurshid notes that Ranganathan in his five library laws emphasized two philosophical concepts: of a book as a means for documentation of ideas, and of library growth as a reflection of expanding knowledge. Shera (1962) restated Ranganathan's laws of library service in terms of maximizing the utility of graphic records for the benefit of the society. Danton (1934) criticized Ranganathan's five laws as not providing open-ended inquiry into the validity of functions and activities; he claimed that library philosophy should start with the philosophy of a society and its role in democracy. Reece (1936) interpreted librarianship in terms of books' influence on the history of civilization through the library's service as a center for expressing economic, social, civil, cultural, vocational, and recreational preferences of the time. Both Danton and Reece added the sixth basic law to Ranganathan's list, the library's role as an educational, scientific, and cultural institution.[38]

### 3.6.3 Technical Aspects: Inventions and their Adaptations

From its beginning, librarianship was identified with the technology of handling reading material. At first this technology was a purely experimental craft. Later, following the inventions in other fields, the technology was adapted to the library operations, allowing for expanding the basic function of book caretaking.

The impact of technology on library operations can be grouped in a number of distinctive issues.

*a. Types of material.*

In the use of clay tablets, librarians concentrated on the techniques of storage. Use of papyrus improved retrieval, codex facilitated easy access, paper simplified duplication, and the computer significantly improved the technique of manipulating information.

The transition from paper to electronics, like the preceding transactions from papyrus to paper, will be a long process. Paper alone was used for five hundred years. Since the 1960s it has been used simultaneously with the electronic medium (e.g., Index Medicus is in both printed and electronic formats). Exclusively electronic formats have had some library applications as reference tools. There is also some total conversion from paper to the electronic image in information retrieval processes, although paper is still used for facsimile transmissions.

*b. Printing and bibliographic control.*

The new technology in publishing was followed by improved indexing of library collections. One of the first bibliographies, compiled in 1545 by Conrad Gesner, *Bibliotheca Universalis*, listed some 12,000 items in Greek, Latin, and Hebrew. Since then, however, the constantly expanding number of publications has made an all-inclusive bibliography impossible. The final unsuccessful attempt to compile a universal bibliography was made in 1895 by Paul Otlet and Henry La Fontaine, who founded the International Institute of Bibliography to compile a complete bibliography of all intellectual literature. Today, individual libraries and library networks compile their own bibliographies and national libraries provided current, cumulative coverage of their collections. Bibliographic control was significantly strengthened by the introduction of the Machine Readable Catalog, which required considerable cooperation in standardizing cataloging entries.

*c. Printing and organization of collections.*

New technology also significantly influenced modern cataloging processes. Until the invention of print, records were arranged by subject.[39] In 1605 one of the first printed catalogs was available in the Bodleian Library. In 1650 the first dictionary catalog interfiled author and subject. In 18th century brief entries were used, with the first national code of cataloging introduced in 1791. In 1815, the dictionary catalog was used in the United States as an index. Cutter's Rules of Cataloging appeared in 1876. The card catalog was the only alternative to the printed catalog until the beginning of the 20th century. The modern system of indexing, classification, and cataloging by author and subject were in full use by the 19th century, significantly speeding up the introduction of automation by interrelating the three approaches.

*d. Printing and access.*

Open access to collections already existed in antiquity, although it was restricted to a privileged few. The need for free access grew in the Middle Ages. At first, it was available through catalogs only, with no direct access to the shelves. Crude resource sharing was practiced in the form of interlibrary lending procedures for copying and reading. Between the 9th and 12th centuries, interlibrary loan transactions were indicated by annotated location in the catalogs. The first known union catalog was compiled in the second half of the 13th century. It covered the collections of 183 monasteries in Great Britain. Interlibrary activities were considerably reduced in the 15th century due to the invention of print.

In the 20th century, open shelf access was initiated in American libraries, and interlibrary loan activities were significantly expanded by creation of a variety of on- and off-line networks. Beginning with the 1970s, informal cooperative and resource sharing arrangements become formalized, through the use of the computer, in a highly structured system of local libraries.[40] "Today . . . the concept of network has shifted to the point where *network* is now equated with *connectedness*. Computer networks are distributed rather than centralized systems and are based on linkages with peers, not top-down control . . . conceptually the terms *network* and *hierarchy* are . . . considered to be on opposite ends of the organizational continuum."[41]

Ladner wonders if direct and almost instantaneous access to computer-based information by end-users, bypassing such intermediaries as librarians, will make the interlibrary loan, and with it special libraries, obsolete in a near future.

*e. Computers.*

At first, library computer services were passive, limited to static data sources. Improved efficiency of database services and information stored in a 'knowledge base' enabled librarians to anticipate users' interests, thus offering not only interactive but also proactive services. At first, data-gathering by computers related to 'how we do things'; later it provided information to 'what, and why we do it.'

Natural language interface permitted human operators to communicate with the computer using human-like language, while visual recognition becomes important to robotics designers.

Interest in artificial intelligence (AI) focused on expert systems, a computer program that solves problems by following sets of rules and reaches conclusions similar to those made by human experts. Artificial intelligence consists of: (1) a database (facts), (2) a knowledge base (e.g., set of rules for comparison and interpretation of data); and (3) an inference engine, applying the knowledge to act on the situation-specific facts that are fed into the machine.

Electronic publications will eventually augment conventional print-on-paper sources. Now, however,it is still essentially an analog of existing printed materials, differing only in its physical (i.e., electronic) format, its different mode of retrieving organized data, and its method of accessing through computerized telecommunication networks.

The changing technology has the greatest impact on the formats providing information, rather than on 'entertaining' or 'inspiring' publications, although they may eventually be reproduced on videotapes and videodisks.

The implications of all the technical changes for libraries are obviously great, although not yet fully recognized. Routine record-keeping activities were automated first, yet manipulation of the machine-readable records was handled exactly the same way as before. It was the on-line access to resources in libraries that significantly modified the concept of the traditional library (Lancaster, 1982).

*f. Research.*

In the 1980s information research focused on relevance, accuracy, and accessibility of information. General Systems Theory was involved in the search for common structures in different fields. In information retrieval activities centered on studying various characteristics of information transfer.

The 1990s began with the increased interest in the application of developments in cognitive psychology and linguistics to library and information environment.

The last decade of the 20th century marks a shift of librarians' primary focus from static information, retained in books, to a much more dynamic information, in part captured by periodical publications. The library retains its traditional archival responsibility, with increased attention paid to direct access to current information, whatever its format: "As the new millennium approaches, librarians no longer serve the book that serve the clients. Questions rule in the age of answers. Linked by its commitment to client information needs instead of knowledge of specific tools, the library profession becomes an information profession defined by its ends rather than its means."[42]

### 3.7 Prophecies of Changes

Foskett (1985) traces the forecasting of a paperless society to Licklider's statement made in 1965, that books are less than satisfactory for storage, retrieval, or display of information and should give way to 'procognitive systems' based on computers. Lancaster predicted that the impact of the currently fast changing technology on knowledge-based economy and the emergence of paperless communications will significantly affect the newly emerging role of librarians in a disappearing library (Lancaster, 1978, 1982).

In his 'philosophical forecast' for 1984, D. J. De Solla Price predicted among other changes, free distribution of major scientific journals (Foskett, 1986). Lancaster (1982) followed with a claim that books would soon be obsolete.

Apostle and Raymond forecast changes in the profession's self-perception. Since "the profession's most important function is the acquisition, storage, organization, and retrieval of information,"[43] they argue that "information has become a key component of postindustrial society" and that "library science and information science are becoming essentially the same activity.",[44] Therefore "libraries will begin to atrophy due to their inability to survive competition for more efficient, electronically-based providers of information, and librarians will have either to transform themselves into information professionals or find themselves unemployed."[45]

Various authors listed several arguments in support of and against these conclusions. They overlooked, however, the simple fact that the profession will most probably absorb the changes not by breaking up, but by expanding its services to all formats of information. Its paradigm will change from library science to a library information science that embraces the philosophical underpinning of a metalibrary (or some other model with a catchy name).

The predictions listed above reflect a "confusion between form and content or method and purpose . . . content or purpose is primary, and should not become dominated by, or subordinated to, method or form."[46]

## 3.8 Critique of the Discipline

The criticism sampled here is of historical value because it points out problems faced by librarians at the time it was made. While some of it has been already answered by the changes made, other may still be relevant to the problems faced by the discipline.

(a) Powell (1954) was critical of a lack of interest in books among librarians. The non reading librarians' argument was that their predecessors' preoccupation with book collecting neglected managerial aspects of their profession. Powell's answer was a question: Who is more important in librarianship, a bookman or an administrator? Either extreme, he maintained, is bad. The need is for fewer rules and no boss-librarian mentality. The ideal library leader would be a bookman by choice, education, and experience. He or she would consider the book itself as a powerful teacher, making the librarian responsible for providing good administrative leadership, by fighting censorship and by being a good public servant. He quoted John Durie (1650): "The proper charge of the library keeper is to keep the public stock of learning, which is in books and manuscripts; to increase it, and to propose it to others in the way which may be most useful unto all . . . "47

(b) Lindsay (1977) maintained that in relationships between a library and its social context, libraries are not sure about the social importance of their function. The irreconcilable contradictions in their practice were created by a lack of theory related to library practice.

The basic assumption in the theories proposed thus far is that the library is a social institution, with a philosophy varying with different political or social systems. Lindsay referred to my statement that main library objectives are justified by their closeness to other societal ideals of democracy and self-realization of its citizens. Other writers, such as Joeckel, Wellard, Kolitsch, McColvin, James Thompson, and Foskett made similar claims. However, according to Lindsay, none of these statements defined democracy, or self-improvement, mystifying the philosophy by using words that no one understands, and justifying indirect uses of power on behalf of others.

All writers subscribed to the conservative tenet that 'better is more of the same'; no one questioned the foundations of these social beliefs. Yet Lindsay believes that the democratic content of our society is decreasing and production and consumption of knowledge by itself might not be satisfactory to save democracy. The library performs the roles different from the one intended by writers criticized by him.[48]

Furthermore, intellectual rigor is absent in present library philosophy, and the gap between 19th century human liberalism and 20th century revolutionary socialism is growing. There is an irreconcilable contradiction, Lindsay concluded, in defining the individual in terms of social relations, profit, money, or the like (Lindsay, 1977).

(c) McCorison (1984) believed that libraries and books are in low esteem because our intellectual and moral order is in shambles. Universities mirror relativistic chaos, with managers rather than educators administering these institutions. The technocrats are in power and curricula are designed to catch the trendiest students and scholars.

Libraries are made financially independent without independent mission or status. Distinctions among books as carriers of knowledge, objects of commerce, or esthetic expressions are observed. Research collections are not tied to the curriculum, hence only private, independent research libraries are able to build specialized collections that give them identity and purpose. Collections must be built around an idea, which has a substance and is not duplicated somewhere else.

(d) Berry objected to the dropping of the term 'library' in the names of library schools. This trend, he maintained, has a disastrous effect by downgrading the profession. Librarians are not managers, specialists, or scientists. The library has a well-established social image as an agency responsible for organizing and servicing resources for information, knowledge and recreation (Berry, 1987).

(e) E. Mason criticized the state of U.S. librarianship in the late 1960s. His review was written at a time of campus revolt and during a period of transition from financial extravagance into a period of scarcity. It was also a period of leadership changes.

Many outstanding librarians who emerged from library schools of the 1930s, as successors of the great public librarians of the late 19th century, were approaching retirement.

Mason's criticism, although obsolete in its reference to specific issues of the 1960s, may contain a valuable lesson in general. It can be divided into three parts.

(1) The organizational structure of American librarianship was criticized for lacking management science techniques above the level of unit cost and system analysis related to computerization. Libraries did not use program budgeting techniques. Linear organizational structure was too slow, inaccurate, and ineffective and should have been replaced by more independent decentralization.

(2) Research collections lacked the delineation of their scope. New programs were built in brief periods without sufficient resources, with shallow coverage of specialized areas as a result. Library experts were not sufficiently knowledgeable about their subject. The professional master degree was not satisfactory preparation for the job. Nonbook material was heavily used in school libraries, replacing the librarian with the A-V specialist. Instructions in the use of academic libraries were relegated to individual department's classroom orientations only (E. Mason, 1971).

(3) Premature Computerization.

Computers were introduced in libraries too early, for prestige reasons, and because they offered 'free' time, with little cost analysis. Their popularity in the period of Sputnik led to disregard for their costs, obscuring many other machine and machine-manual alternatives. They were introduced into libraries in the early sixties, when the largest problem was operational, whereas at the time of the essay, in the late sixties, the major problem was largely financial. Consequently, the misplacement of limited resources resulted in diminished collections and reduced services, at the time when both were most needed.

Automation was brought to university campuses by physical scientists, mathematicians, and engineers for its computational facilities, introducing a new campus ecology, polluted by technologists and plagued by politics, and financial crises exacerbated by the need for expensive programming. In the library, computer response time was confused with the response time of computer processing. On-line circulation became very expensive, acquisition very slow, and labor cost (salaries of programmers) significantly increased.

The decision to automate was not based on managerial principles: costs were not evaluated or projected. Yet a computerized system is virtually irreversible. If it would have been more economical in the 1980s, Mason argued, then it should not have been introduced in libraries until then (E. Mason, 1971a).

(f) Ten years later, Robert M. Mason acknowledged the value of computers. Computer 'learning' consists of the ability to recognize a problem that it has solved before and the capability to select relevant facts. Human knowledge includes, in addition to facts, the meaning and the significance of these facts. People can use common sense by utilizing computers' nonstandard logic to change previous conclusions in light of additional information (R.M. Mason, 1985).

(g) Schrader, in discussing the nature of the discipline, commented on library anthropomorphism. It is a logical fallacy to treat social institutions as living organisms, e.g., to describe information as verbal transactions between persons, neurons in the brain, sensors in animals, chemicals in cells, or physical changes among inanimate objects. As Fairthorne (1969) noted, collision between two stones is not a transfer of information. Mechanistic reductionism implies that a machine can do everything a human does. This overlooks, Schrader concludes, such concepts as family, ethnic group, culture, or educational systems. In man-machine communication the concept of personified machine is confused with mechanized persons.[49]

(h) Similar criticism of automation was made in other countries. For example, Line maintained "that we must not automate what we do not understand,"[50] since "we cannot evaluate the adequacy of a system solely from the use made of it, for this use is itself conditioned by the system."[51] After all, readers will not use a system that they do not expect to be useful to them. "We see deficiencies of our libraries, but we do not know what useful purposes are hidden by these same deficiencies. And if we automate a system whose virtues and faults we do not understand" -- Line reminds us -- "we are in a great danger of automating the superficial aspects only and destroying the real virtues."[52]

Following Donald Urquhart's example, Line also focused on the demystification of library and information science. He defines it as "a process of stripping to the bare essentials"[53] the hope for developing 'right' structure, 'correct' cataloging rules, or maintaining 'faith' in the power of numbers by counting the citations, or automating everything.

(i) Lofgren was concerned that post-industrialism would exert a negative influence on librarianship by shifting library focus from the traditional, cultural approach to one based on a business or corporate-market approach. The new emphasis is on "self-image of librarian as a professional with technical proficiency, selling services to whoever is able to demand and pay for these, [and on] belonging to the technico-professional elite that has such a crucial position in the post industrial image of the future."[54] It is a shift from the idealism of "the nineteenth century social and political philosophy of liberalism with its emphasis on the role and rights of the individual" [55] to a post-idealism of current pragmatism.  Notwithstanding a very substantial impact of new technology on library operations, the anticipated revolution, Lofgren notes, has not yet materialized, but its popular imagery continues to attract some writers.

## 3.9 Summary and Conclusions

At each milestone of library history, different options were available to the discipline. The choices made influenced the future of the discipline, changing its approach from the antiquarian storekeeper to librarianship as a major social agency.

Library heritage is long and rich. It stretches from secular collections of manuscripts in antiquity, emergence of religious and vernacular libraries in the Middle Ages, the Renaissance's private collections, new library organization during the Reformation, a scientific explosion in Enlightenment, national and public libraries in the 19th century, and an electronic revolution in our own lifetime. Technology is finally making it possible to integrate the multitudes of individual accomplishments into a unified discipline.

Today the discipline faces a crisis of self-identity. It is divided in its focus between (a) the traditional preoccupation with service and the new interest in the theoretical analyses of it, and (b) the pragmatic function of assisting in patrons' search for needed records and the scholarly pursuit of research into the generic concept of information itself. In the next chapter the discipline searches for the unifying solution by redefining itself, in hope to finding some common ground for all its fragmented viewpoints.

## NOTES.

1. Winger, H. (October 1961). "Aspects of Librarianship: A Trace Work of History." *Library Quarterly*, p. 333

2. The distinction among Library, Librarianship, and Library Science as subdivisions of the discipline are accomplished by capitalizing the terms standing for each unit.

   The distinction between the popular use of 'information' meaning many different phenomena, and its narrow, technical definition as one of the phases in knowledge transfer, is more difficult. To avoid confusion and to restrain from inventing a new term, I use 'informations' (plural) as a shortcut for its technical interpretation.

3. Nitecki, J. Z. (July, 1964). "Public Interest and the Theory of Librarianship." *College & Research Libraries*, 25(4), p. 275.

4. Farrington, B. (1944). *Greek Science*. Harmondsworth, England: Penguin Books, p. 14.

5. Ibid., p. 13.

6. Ibid., p. 15.

7. Shera, J. H. (1957). "Pattern, Structure and Conceptualization in Classification." In *International Study Conference on Classification for Information Retrieval*; *Proceedings of the Conference*. Dorking, England. London: ASLIB, p. 115.

8. Cassisorus, Institutions divinarum et saecularium litterarum, quoted after Hessel, 1955, p. 13.

9. See Hessel, 1955, p. 80, passim.

10. McCorison, M. A. (Second Quarter 1984). "Bibliography and Libraries at the Brink: A Jeremiad.": *The Papers of the Bibliographical Society of America*, p. 136.

11. The changing attitude toward traditional cataloging and classification was illustrated by the popularity of the 'speed cataloging' (Nitecki, 1969), 'simplified classification' (Nitecki, 1969) and introduction of title subdivision in the card catalog at the University of Wisconsin-Milwaukee (Nitecki, 1968, Nitecki, 1970). Title arrangement was later fully utilized in computerized catalogs.

12. Graziano, E. E. (1955). *The Philosophy of Hegel as Basis for the Dewey Decimal Classification Schedule*. Unpublished Master of Art Thesis. The University of Oklahoma, Norman, Oklahoma, pp. 1-2.

13. Ibid., p. 52.

14. Ward, D. V. (1987). "Metaphysical Issues in Classification Theory." In *Information: The Transformation of Society*. Proceedings of the 50th Annual Meeting of the American Society for Information Science, Boston, October 1987. Learned Information, Medford, N.J, p. 255.

15. Broadfield, A. (1946) *The Philosophy of Classification*. London:Grafton, p. 27.

16. Also published in this year was Dewey's Classification Scheme, and Cutter *Rules for a Printed Dictionary Catalog*. A divided catalog in New York, and a telegraph for internal communication in British Museum, were displayed; also the American Library Journal published, and a regional union list of periodicals was begun in Baltimore.

17. Quoted after Reith, 1984.

18. Winter, M. F. (1988). *The Culture and Control of Expertise; Toward a Sociological Understanding of Librarianship*. New York: Greenwood Press. (Contributions in Librarianship and Information Science), p. 86.

19. The term 'librarianship' is also used loosely as a description of the discipline, or its science. As already mentioned, I capitalize the term 'librarianship' when it refers to the profession of Librarianship.

20. For an interesting profile of a nineteenth-century British librarian, scholar, and encyclopedist, see McCrimmon, 1989.

21. Danton, J. P. (October, 1934). "Plea for a Philosophy of Librarianship: Philosophia vero omnium mater artium." *Library Quarterly*, 4, pp.528-29, 551.

22. Danton, J. P. (June 1941). "University Librarianship; Notes on Its Philosophy." *College & Research Libraries*, 2(3), p. 201.

23. Kaser, D. (July 1971). "The Ptolemaic Theory of Librarianship." *Oklahoma Librarian*, p. 13.

24. Harris, Michael H. (1986) State, Class, and Cultural Reproduction: Toward a Theory of Library Service in the United States. Advances in Librarianship, vol. 14, p. 215.

25. Ibid., p. 221.

26. Ibid., p. 242.

27. Ibid., p. 245.

28. Ibid., p. 241.

29. Types refer to common characteristics shared by classes of individuals; kinds refer to the classes of entities with common characteristics differentiating them from other classes.

30. The library code of ethics is formulated in terms of (a) practitioner-client relations; (b) relations with colleagues, and (c) employer-employee relations. The rights and obligations are stated in (1) the ALA's Library Bill of Rights, 1939; (2) The Statement of the Committee on Intellectual Freedom, 1940; (3) The Intellectual Freedom manual, 1974; and (4) the Newsletter on Intellectual Freedom and Intellectual Freedom Primer, 1977. See also ALA (1930, 1975).

31. Burke, R. A. (1953). *Culture and Communication Through the Ages.* (The book began as a joint endeavor with Pierce Butler), p. 46-e.

32. Karetzky, S. (1982). *Reading Research and Librarianship; A History and Analysis*. Westport, Conn.: Greenwood Press. Contributions in Librarianship and Information Science, Number 36, p.xvii.

33. Butler, P. (1943). "Survey of the Reference Field." In P. Butler (ed.), *The Reference Function of the Library* (pp. 1-15). Chicago: University of Chicago Press. Papers presented before the Library Institute at the University of Chicago, June 29 to July 10, 1942, p.4.

34. See also Tague, J. (June 1979). "Information Science in Graduate Library Programs." *Canadian Library Journal*, 36(3), p. 89.

35. For a discussion of different reading processes and the librarian's role in meeting patrons' reading needs, see Nitecki, J. Z. (August 1986). "Creative Reading; Of Better Thoughts and Words." *Canadian Library Journal*, 43(4), 229-233.

36. Debons, A. (1974). *Information Science; Search for identity*. New York: Marcel Dekker. Proceedings of the 1972 NATO Advanced Study Institute in Information Science held at Seven Springs, Champion, Pennsylvania, August 17-20,1972, p. 462.

37. Khurshid, A. (January 1976). "Intellectual Foundations of Library Education." *International Library Review*, 8, p. 4.

38. Ibid., p. 11-13.

39. In the 16th century Konrad Gesner (1548) arranged his compilation alphabetically by author. Benedictine monks (1560) had 5 catalogs: by author, classed shelf list, alphabetical subject index, index to reserves and letter codes with first letter indicating the size, second the color, third the subject of the book.

40. Ladner, Sharyn J. (1992) "Resource Sharing by Sci-tech and Business libraries: Informal Networking and the Role of Professional Associations." *Library and Information Science Research Electronic Journal* (E-mail from Editors@Kentvm), December 15, 1992, 1428 lines.

41. Ibid.

42. Quint, B. (April, 1992). "The Last Librarian: End of a Millennium." *The Canadian Journal of Information Science/Revue Canadienne des Sciences de l'information*, 17(1), p. 32.

43. Apostle, R. and Raymond Boris. (December 1986). "Librarianship and the Information Paradigm." *Canadian Library Journal*, 43(6), p.377.

44. Ibid., p. 382.

45. Ibid.

46. Foskett, D. J. (April 1985). "A Note on Libraries and the 'Paperless society'." *International Forum on Information and Documentation*, 10(2), (Letters Column), p. 47.

47. Powell, L. C. (1954). "A Bookman's Credo." Quoted from B. McCrimmon (Edit.), *American Library Philosophy*; *An Anthology*. (pp. 161-164). Hamden, Connecticut: The Shoe String Press, 1975, p. 164.

48. In his essay, Lindsay (1977) also discussed views of Lenin on the library role in society, Nyere on education, Marx on German ideology, Miliband on the state and capitalism, Poulantzas on class and politics, Mills on sociology, and Caudwell on aesthetics.

49. Schrader, A. M. (1983). *Toward a Theory of Library and Information Science*. Unpublished doctoral dissertation, Indiana University, Bloomington, Indiana, pt. 1, pp. 99-110.

50. Line, M. B. (1968). "The Functions of the University Library." In W. L. Saunders (ed.), *University and Research Library*. (pp. 148-158). Oxford,England: Pergamon Press, p. 148.

51. Ibid., p. 150.

52. Ibid., p. 151.

53. Line, M. B. "Demystification in Librarianship and Information Science)." (1975). In Line Maurice Barr (eds.), *Essays on Information and Libraries. Festschrift for Donald Urquhart*. London and Hamden, Conn.: Clive Bingley (London) and Linnet Books (Hamden), p. 110.

54. Lofgren, H. (November, 1985). Post-Industrialism and Librarianship: A Critique. *The Australian Library Journal*, 34(4), p. 28.

55. Ibid.

# CHAPTER 4:
# THE ISSUE OF LIBRARY INFORMATION SCIENCE SELF-CONSCIOUSNESS

## 4.1 Definitional confusion

### 4.1.1 Lack of consensus.

A review of the literature on librarianship shows the disjunctive character of its definitions and an artificial separation of its two subfields, library and information science. Individual definitions of Library or Information Science address some, but not all, aspects of the discipline, while the concept of information science shows more similarities with, than differences from, library science.

Lack of consensus among librarians and information scientists is illustrated by definitional confusions and often contradictory hypothetical assumptions about the nature of the discipline. The argument for a definitional unity of the field, referred to as Library Information Science (LIS), is based on the comparison among the three philosophical approaches to the concept of 'definition'. It is suggested that the prescriptive, linguistic, and essentialistic approaches individually define different aspects of the field. However, together they refer to the same conceptual unity, informational environment, and subject matter.

Irwin in the old *Encyclopedia of Librarianship* (1961) says that although the subjects covered by the term 'Librarianship' are many, there is "nevertheless something much greater than the mere sum of these subjects. It shares with certain other vocations . . . something indefinable which transforms it from a mere occupation into a way of life."[1] That 'something' to Irwin is the satisfying reward of the vocation. To me it is the essence of Librarianship, expressed in the philosophy of librarianship. Irwin dismisses the philosophical approach as a high-sounding phrase that merely signifies three purposes of librarianship: to teach, to do research, and to entertain.[2]

As will be shown in this book, there is much more to the definition of librarianship than a mere description of its purposes.

### 4.1.2 Variations in Self-perception

A brief survey administered by me confirmed the notion of a lack of uniformity in defining the field of library information science. The survey focused on the identification of common bibliographic denominators in information science, shared by the faculty of the library school in one university.[3]

The term 'information' was defined by most participants as either a process or a commodity. The definitions of 'information science' were grouped in three clusters similar to Mansfield's (1987) threefold approach to the classification of the concept of information science. (1) The most frequently cited was the socio-technological definition emphasizing recorded information, its organization, classification, transfer, utilization, storage, and retrieval. (2) The system approach to the definition stressed an interdisciplinary character of information science, bridging viewpoints of social science, cybernetics, systems theory, computer science, and other disciplines. (3) In the least-cited, cognitive approach, information science was defined as a building of a predicative system based on the interaction between the input in the form of a neural flow and the output of a receiving system.

The weakest consensus was displayed in identifying the domains central to the interdisciplinary nature of information science. Listed in descending order they were: (1) management, viewed as organization and decision making; (2) miscellaneous disciplines, such as communication, mathematics, cybernetics, philosophy, and systems; (3) Library and Information Science and indexing; (4) computer science, including Artificial Intelligence, expert system, and optical storage; and (5) social and behavioral sciences, cognition, psychology, neuroscience, linguistics, and social anthropology.

The size of the sample was too small to generalize the uniqueness of the concept 'information', or to define the criteria that would distinguish the field from other disciplines. However, the study revealed, at least in this case, a high degree of divergence in interpreting the phenomenon of information, and the complexity and diversity of information science as a field.

### 4.1.3 Hypothetical Opposites

Part of the confusion in defining the nature of Library Information Science (LIS) is created by a number of hypothetical opposites, i.e., assumptions that contradict each other within many definitions of the field,

(a) The subject matter is often seen either as a physical thing, with physical properties, such as a book, or as a sign or a message with informational properties such as meaning, validity, relevance, or information content. The physical view of an information system focuses on the volumes of data, speed of transmission, reliability, and adaptability of its components. On the other hand, an information system loosely defined as a message conveys the views and intentions of the author, expressing his or her concept of information.

(b) In the LIS theory, the interpretation of reality can be subjective, metaphysical, and intellectual, or objective, physical, and sensual. The specific approach reflects a humanistic, scientific, or philosophical viewpoint, distinguishing between structure and form, substance and content, or metaphysics of ideas and physics of operations. The methodology may be deductive, logical and theoretical or inductive, empirical, and experimental.

(c) On the issue of neutrality, there is a long-standing conflict between the requirement of objectivity in providing information and the subjective needs of a patron; and the related distinction between the role of reference assistance to satisfy a patron's request for information material versus interpretation of its meaning. Selection of library material is necessitated by the limited resources; at the same time, it is criticized as unintentional censorship.

(d) The two disciplines of library and information science are seldom considered jointly; most often they assert their own separate identity, evading further elaboration. Yet both subdisciplines must be grounded in a social practice and services that are uniquely formulated in human affairs. Both focus on social practice, with the primary emphases on communicating information, identifying its content, and relating the domain of research to the scientific, philosophical, or praxiological dimensions (Schrader, 1983).

In instances where the two subdisciplines are interrelated, the reasons given are often equally inadequate. The approach is criticized by Schrader for substituting all-inclusive phrases such as 'and others,' for formal definitions, and for the use of vague analogies and metaphors. There is no professional consensus, for example, on the use of domain neologisms. Generic functions are conceptually misused as synonyms, mixing different dimensions of the domains, such as philosophical with sociological.[4]

(e) And finally, society's prevailing preferences are the factors in determining library specific services, which vary with different times and locations. They are implemented horizontally, by different kinds of libraries serving different populations, and vertically, by serving different individuals with different backgrounds and needs. Hence, no two libraries are ever exactly the same.

## 4.2 Divergences in Defining 'Definition' [5]

Different interpretations of 'definition' can be broadly summarized into three major groups: the prescriptive, the linguistic and the essentialistic approach (Abelson, 1967).

### 4.2.1 Prescriptive Definitions

The prescriptive approach considers definitions as imperative sentences, naming the things or events, rather than providing any information about them. There are two major prescriptive viewpoints. The nominalists explain "definitions as semantic rules for assigning names to objects," while the formalists consider definition "as syntactic rules for abbreviating strings of symbols."[6]

Nominalism is represented by Bacon and Hobbes, who view definition as a means for avoiding ambiguity and semantic confusion, by insisting that the descriptions used are empirically verified.

Formalism is a preferred approach of some scientists, like Pascal, for whom the definitions are "conventional labels, that need have nothing in common with the things they name."[7] Russell and Whitehead defined " 'definition' in terms of sameness of meaning . . . 'concerned wholly with the symbols, not with what they symbolize.'"[8]

Probably the most popular among librarians as well as information scientists, the prescriptive definitions are limited to the naming of different components of the field. There is an interesting parallelism between the ways these elements are defined by both the practitioners and the theoreticians of Library and Information Science. Both reduce the definitions of the discipline to observable and measurable properties of information, which has to be stored and later retrieved. This approach makes the discipline at least partly free from metaphysical ambiguity, at the price of saying very little about the essential nature of the reality addressed by the field.

### 4.2.2 Linguistic Definitions

The linguistic approach considers definition as a declarative sentence which communicates information; that, however, is determined by the way language is used to define that information.

J. S. Mills and G. E. Moore were the precursors of this approach in some of their interpretations of the concept of definition. Mills maintained that definition conveys information when it reduces complex ideas into simpler components. Moore restricted its meaning to explanatory and clarifying functions. The more recent philosophers, such as Ryle and especially

Robinson, provided more direct linguistic interpretation of definition "as reports of word usage."[9]

### 4.2.3 Essentialistic Definitions

The oldest and best developed is the essentialist view of definition as a conveyer of information through cognition. It began with the Socratic question of 'What does x mean?' followed by a variety of answers, most of them metaphysical, clarifying different aspects of definition through metaphors. Plato's answer was formulated in terms of the abstract form of an idea or a standard, expressed in the relationships between the object of definition (an abstract concept) and its empirical description (a copy of the concept).

Aristotle distinguished between the real definition of causal relations and the nominal, prescriptive definition. Causal relations are expressed in the systematic classification of different relations.

Locke's 'ideas' and Kant's 'concepts' are the products of cognition through introspection, intuition, or conceptual analysis. Thus, the essentialist's view of definition incorporates both: Locke's physical and psychological aspects of definition, and Kant's analytical (predicative) elements and synthetic (a priori) rules.[10]

### 4.3 Schrader's Linguistic Analysis

The linguistic approach, by concentrating on the rules of language, recognizes the importance of the relationship between definitions and the meaning defined by them. However, the approach limits the interpretation of these relations to the meaning as it is expressed in the descriptive language used.

The linguistic approach to the definition of library and information science is well illustrated by Schrader's analysis. His detailed, fully documented doctoral study presents a logical and conceptual analysis of over fifteen hundred definitions of library and information sciences printed in the last hundred years (Schrader 1983). "The analysis reveals a profound depth of confusion, disagreement, contradiction, and inconsistency . . . Nowhere are the flawed claims more apparent than in the efforts to tease apart a domain of information science . . . from that of library science." [11],[12]

Schrader identified two approaches to the definition of the domain of library and information science: (1) an empirical approach based on observation and experience and assumed to be a self-evident description of the whole field; (2) the conceptual approach, which was selected by Schrader for his own definitions and uses logical analysis of the content of definitions to determine the relationships between the meaning of the concept and the term expressing it. "Discourse about a domain does not arrange itself in social reality; it must be rendered explicit.

Concepts must be expressed as a system of linguistic terms."[13] Schrader examined each definition of the domain by first identifying various usage of the terms in different definitions. He compiled a list of synonyms for the meaning of each term. Next he reviewed the definitions' social functions in library and information contexts. The resulting topology of definitions contained (a) the name used to designate the domain; (b) the nature of the domain, such as a study, science, practice, art, technology, or their variations: (c) the description of the content of the domain, such as knowledge, recorded knowledge, information, or specific types of records and (d) the function of the domain, that is, the type of activity the domain is involved in (called by Schrader 'physical or immaterial objects') and the person requesting the record, or both.

### 4.3.1 Library Science (LS)

The name of the domain changed throughout the history of the discipline. The term 'library science' was defined as a scientific study for the practical organization of a library. 'Librarianship' stood for 'the office or work of a librarian.' The terms "library economy', 'library science', or 'library service' were used interchangeably for the management of libraries. 'Bibliothecal science' referred to the library collections. 'Bibliology' or 'applied bibliography' meant "the systematic description and history of books, their authorship, printing, publication, editions, etc."[14] The nature of library science was also defined in several ways, among them as a bibliographic activity, a discipline, an educational enterprise, an interdisciplinary field, or an empirical or metaphysical phenomenon.

Schrader discussed several terms associated with each concept, such as object (e.g., 'to retrieve'), people (e.g., 'to teach') and combination of both (e.g., 'to link'). He also developed a long list of synonyms for each generic term (e.g., for the term 'to process' the synonyms were 'to handle, manipulate, restructure, or repackage').

Schrader concluded that (a) there is no consensus on the domain of the discipline, since its definition ranges from the study of the physical records to that of cultures; (b) the foci of the definitions vary by centering either on objects, people, processes or activities; (c) definitions lack consensus on the meaning of basic concepts, such as 'library', 'knowledge', or 'book'; and (d) idiosyncratic citations provided poor references to original sources.[15]

Librarians engage in an activity that has as its goal effective access to recorded knowledge and service to those seeking such access. In these bibliothecal activities, the librarian encounters the structural and functional properties of the recorded objects that are in need of control. Documents exist as objects, contents, or as use potentials, whether intended or not. It is up to the librarian to understand the properties of the bibliothecal situation and to translate them into a functioning system.

Librarianship can be defined as a professional activity (essential here is 'doing'), or as a field of study (essential motive is 'knowing'), where 'to know' means to grasp and to explain.

### 4.3.2 Information Science (IS)

Schrader's methodology in analyzing the definitions of information science is similar to the one used in the previous section. And the findings are also similar. The definitions are illusive and even less conceptually organized than the definitions of Library Science. References to previous definitions are uncritical and repetitious. The study and practice of the discipline are conflated, not distinguishing between the study of information-related concepts and their applications. Descriptions of the field's scientific status defend the claim rather than elaborate on its meaning, and they narrowly interpret the discipline's technological aspects. Inappropriate analogies, circular definitions and vague notions of 'information' add to the conceptual chaos.

In various definitions of information science, Schrader notes, reference was made to objects, persons or both, at social, psychological, biological, or physical levels. Information was considered as knowledge, data, ideas, facts, or documents. The emphasis of quantification reflects naive logical positivism, which suppresses social, psychological, and philosophical dimensions. Stress on applied or technological aspects of the domain equates its means with ends of the discipline. Information is considered as either input or output, shifting from anthropomorphism to mechanistic reductionism. This is the fallacy of using one level of analysis to explain another.

The name of the discipline 'information science' was implied in the term 'bibliography' used by Paul Otlet, and later replaced by Henri LaFontaine with 'documentation'. Both terms relate to the collection and classification of scientific and specialized literature. 'Information retrieval', introduced in 1950 by Calvin Mooers, described the function of providing access to stored information. 'Information science' is the American term for computer-related activities. Finally 'informatics' was suggested by Russian writers, to distinguish the activities of information scientists from those of librarians.[16]

The nature of information science is as diverse as that of library science, and the descriptions of activities in both subdisciplines are similar, with more frequent references to scientific aspects in information science. The range of these descriptions is illustrated by a variety of criteria used in defining information and theories of information science. Samuelson (1974) categorized information theories according to nine components: environmental, sensing, informative, diagnostic, purposeful, or oriented toward action, result, goal, and ultimate objectives. Vagianos (1972) distinguished between information science as a part of social, natural, theoretical, technological, and professional sciences, and information science as metascience. Wersig and Neveling (1975) considered information as a phenomenon, means, technology, or a purpose in which it was used.

Hayes (1969) argues that information science cannot exist as a separate discipline and that it should always be considered in the context of a specific discipline.[17] Machlup and Mansfield focus on 'cultural diversity' in studies of information (Machlup and Mansfield, 1983).

Similar to the focus of library science, the focus of information science reflects, Schrader continues, a trichotomy of emphases on objects, people, and on the relations between the two. Many of the generic terms are the same in both fields (e.g., 'to retrieve', 'to teach', and 'to link').

Schrader concludes that "the conceptualizations of library science are inadequate because of their institutional bindings while the conceptualizations of information science are inadequate because of their object binding."[18]

### 4.3.3 Library and Information Science (L&IS)

Schrader's own definition of library and information science is developed in the context of human social reality, focusing on the unique role of the librarian or information consultant "to bring about access to something for someone who is seeking that access." [19] The selected universe of discourse itself is a multi-dimensional study of different problems and issues considered in terms of general system theory.[20]

Both library and information sciences are defined as systems of human social practice in which both librarians and information scientists facilitate access to selected cultural objects for the inquiring patron. The system proposed by Schrader consists of four components:

(1) The system affector (e.g., librarian); its function is to provide access to the symbolic cultural objects or their bibliographic surrogates. (2) The system affectee (the user) is the seeker of the access to these objects or their bibliographic representations. (3) The system content, the carriers of the symbolic culture, which stand for the reproduced symbolic culture, replacing terms such as 'information', 'knowledge', or 'cognition'.(4) The setting, i.e., the physical, cultural, or administrative environment.

Within the larger societal system, the above components and interrelationships between them constitute the 'symbolic culture access system', the universe of discourse of library and information sciences.

The fundamental processes of the system are twofold: to guide and to seek access to the symbolic cultural objects. The objectives of the system are summarized as scientific, philosophical, or praxiological inquiries into quantitative, qualitative, and performative aspects of the system; its 'what-is' and 'what-to-do' are reflected in the principles, policies, and operations of the system.[21]

The knowledge provided by the inquiries is the result of different kinds of analysis. Empirical analysis relates to scientific, conceptual or philosophical knowledge. Both the empirical and the conceptual analyses refer to praxiological knowledge, while the perceptual analysis provides the qualitative and transactional analysis to the performative knowledge.

The value of the library system, its goodness, relates to its two dimensions: the philosophical, expressing an intrinsic worth of the opinion or knowledge made accessible: and the praxiological instrumental worth of the effectiveness of the system, in obtaining the desired opinion or knowledge.

Schrader considers both library and information approaches as parts of one discipline with a social role to facilitate the access to recorded manifestations of culture.

The analysis is, however, restricted by its design to the linguistic study of taxonomic aspects of the discipline. It is an important step toward theory formulation, but it does not go beyond the definitional stage. "Further logical and conceptual inquiry is needed in order to relate the symbolic culture accessing system to other domains of social practice,"[22] but also to develop a philosophical framework establishing library and information science as a unique, interdependent discipline.

### 4.4 Applications of Different Approaches to the concept of 'Definition'

All the above approaches, if applied separately, are criticized by Abelson for their mistaken assumption "that if definitions convey knowledge, then the knowledge they convey is of the same type as that conveyed by ordinary statements of facts. Essentialists conclude that the knowledge conveyed by definitions is descriptive knowledge of essences, linguistic philosophers conclude that it is descriptive knowledge of language usage, while prescriptivists maintain that definitions do not convey knowledge of any kind."[23]

Abelson is especially critical of the metaphorical approach, claiming that at best it can be verified in terms of its logical consistency, which although sufficient in a logical system, is "merely a necessary condition for sound definitions." [24]

In my definition of LIS, a metaphor is used not as a definition itself, but as a method of describing the essence of LIS in terms of its manifestations in the more familiar structure and functions of the discipline. It offers the opportunity to understand the less known facts or events by means of experiences more familiar to us. Through metaphors we can expand our understanding beyond sense perceptions. "It is as thought the ability to comprehend experience through metaphor were a sense, like seeing or touching or hearing, with metaphors providing the only ways to perceive and experience much of the world. Metaphor is as much a part of our functioning as our sense of touch, and as precious."[25]

Abelson proposes a fourth approach, which provides a context for the definition. He calls it a pragmatic, contextual viewpoint. Notwithstanding Abelson's criticism, each approach provides a valid description of different aspects of the definition.

The prescriptive definitions are used in logical and mathematical conventions by assigning specific symbols for given abstract statements in a nominal definition. In librarianship they are used in thesauri by providing formal definitions for individual terms, with cross-references to synonyms and homographs. Such definitions communicate meaning only in terms of the specific context for which they were designed and are valuable in technical operations such as indexing, cataloging, and classification.

Abelson's own focus is on the evaluation of definitions as good or bad, determined by the kind of knowledge sought. He is interested in the knowledge of the effective use of words in definitions, which, in turn, depends on the purposes for which a definition is formulated.

My analysis is based on the definition of knowledge as relations known between more and less familiar events or facts. In this approach the universe of discourse is based on a conceptual search for the essential, basic relations first. The contextual evaluation of the effects of these relations, or the procedural evaluation of the prescriptive values, follows and not precedes the search for the meaning of these relations. All three aspects of the definition are important, however, and are incorporated in the metaphorical model of metalibrarianship, developed later in this book, by considering each approach as a separate but interdependent dimension of the definition of metalibrarianship.

In this section the focus is merely on describing the field of librarianship; in the proposed model of metalibrarianship the aim is more ambitious, to identify relationships that are unique to the field considered as a bona fide discipline.

"When metaphor is considered as a tool for communication, attention is focused on its use for the exchange of information among speakers and listeners. The consideration of metaphor as a tool for thought, on the other hand, is concerned with the discovery of relationships between seemingly disparate domains and an exploration of the extent to which they can be related."[26] The interpretation of the meaning of LIS is explicated by a synthesis of the prescriptive, linguistic, and essentialistic definitions. It is an analytical process of obtaining a predicate (a relational association of different definitions of L&IS) by analyzing its subject (LIS subject matter). It is a mental process, which in the Kantian sense explains the meaning of the discipline by mentally dissecting its subject matter.

## 4.5 Conceptual Unity Among Information Sciences

The thesis of this book is the hypothesis that all information agencies dealing with recorded knowledge share some basic, common characteristics. They all evolved from the activities of the traditional library and therefore are expressed here in the form of metalibrary model. In literature their theoretical formulations are developed under the auspices of Library and Information Science (L&IS).

A straightforward but somewhat simplistic argument for the unity of library and information sciences was provided by Wilkinson. After reviewing the few published definitions of the two fields she concluded that philosophically both of them are "one and the same." [27]

The functions of the two disciplines, Wilkinson argues, are similar: library science is a theoretical framework based on long-existing library practice, which focuses on acquisition, organization, and utilization of information records. Information science is the theory addressing properties and behavior of information (Harrod, 1977) and information-producing processes (Hayes, 1980). Both disciplines study human communication processes,[28] and both deal with information 'containers' (the products of record-keeping), with a purpose that has remained unchanged throughout the ages: "to commemorate, to communicate, to pray, to calculate, to measure, and to preserve."[29] In library science these containers are identified and classified, and in information science they are filtered for relevant information. With time, the format of containers changed, from tree bark to printed records, and the process of recording from marks in stone to computers. Both approaches study relationships between subjective human knowledge (Popper's World 2) and the accumulated objective knowledge (Popper's World 3). And finally, both relate to a unique role of librarianship, the study of the "relationship between social needs for information on the one hand and imprinted knowledge on the other."[30] When they are so perceived, Wilkinson concludes, "there is no distinction between the role of the librarian and the role of the information scientist. They are one and the same discipline."[31]

## 4.6 Common Denominators

All information agencies, whether differing by subject, location, or clientele, share the same subject matter (their structure, function, and processes); they are subject to the same kinds of influences from without (cultural, political, and technical environment); and their role in the society is evaluated from similar vantage points (psychological, sociological, and philosophical).

### 4.6.1 Common Subject Matter

In this book, the subject matter of information agencies is defined conceptually, as a series of relationships between the availability and needs for information (information transfer parameters) on the one hand, considered as independent variables, and on the other, as three basic dependent variables describing the structure of the physical library, the purpose of the information agencies, and their functions. [Fig. 4-1]

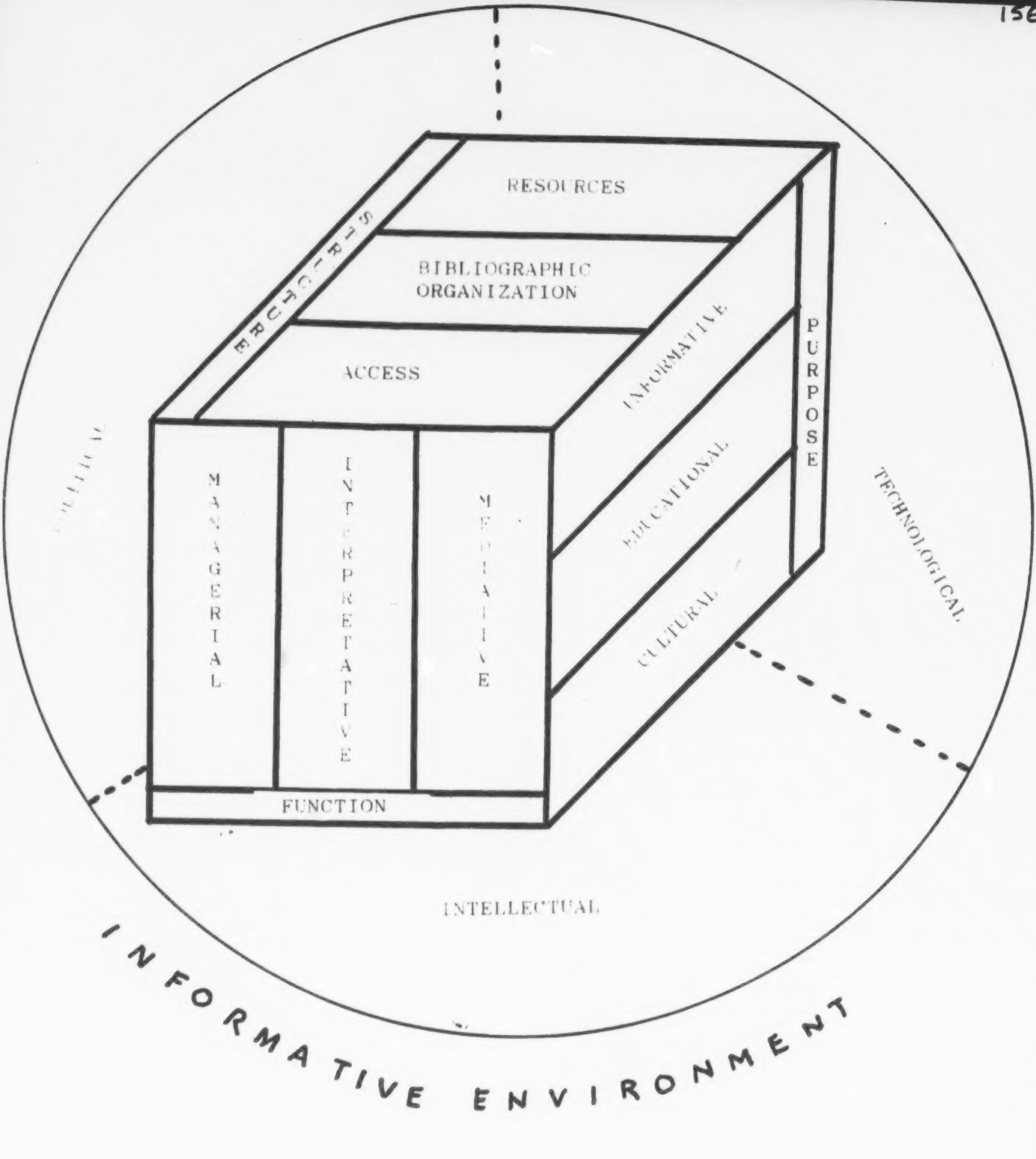
RESOURCES
BIBLIOGRAPHIC ORGANIZATION
ACCESS
STRUCTURE
PURPOSE
INFORMATIVE
EDUCATIONAL
CULTURAL
MANAGERIAL
INTERPRETATIVE
MEDIATIVE
FUNCTION
POLITICAL
TECHNOLOGICAL
INTELLECTUAL
INFORMATIVE ENVIRONMENT

FIG. 1-1: COMMON DENOMINATORS OF INFORMATION AGENCIES

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Mukherjee's (1966) review of library-science subject matter illustrates a variety of interpretations of common denominators. Danton (1934) defines the subject matter of LIS as collection, preservation, organization, and utilization of graphic and printed materials used in recorded communication. Wheeler extends Danton's definition to include individuals who are able and willing to seek information, recreation, or self-development. Broadfield (1949) combines subject matter with the art of human skills and scientific attitude of observation, causation, and efficiency. Foskett (1962) sees it as a social science with social aims. Meyer (1925) stresses production, care, and use of records of knowledge, Temple (1949) identifies organization and manipulation of records as major aspects of subject matter. Wheeler (1946) adds to it the processing of books and their utilization.

### 4.6.1.1 Structure of Information Resources

The structure of the generic information agency is viewed as a system combining basic components of the physical resources -- that is, (a) collection of recorded information (resources), (b) organization of their content, and (c) access to them. Each of these components can be expanded into more specific and technically more complex concepts, such as acquisition and ordering of material.

The structure of any information agency is based on a general objective of bringing the right book to the right person at any cost (Roden, 1923). The focus is on generic books as living organisms, controlled by a librarian as a 'doctor and a hygienist' of reading. Library structure combines both the humanistic concerns about the values of what librarians do and the scientific focus on discovering laws about people's need for and use of information.

Generic books are defined by Shores (1971) as the sum total of human communication. Their function is to realize the reader's abilities through reading (Clayton, 1940). The process of discovering the topic of interest, selecting, and reading the appropriate book is part of the reader's self-development. The social function of a book is a transmission of society's experiences to the individual (Butler, 1933).

(a) Library resources represent society's culture and are treated as its reference and as a storehouse of information. The gap between a potential collection of all knowledge and the actual accessible knowledge in a particular collection is narrowed by better cooperation between libraries, promotion, bibliographic instruction, and access (Savage, 1946).

Sociological analysis of book selection is based on an ideal of meshing together the reader's purposes with the impact of reading on them. For reading satisfaction to be achieved, focus on those types of readers that the library can best serve is required. Most readers seek reinforcement of their beliefs rather than a purposefully guided change (Goldhor, 1942).

(b) Bibliographic organization of resources discussed here refers to the collection's classification and cataloging. Classification "consists of that part of the theory of librarianship which deals with the organization of knowledge -- a basic operation in the advancement of learning . . . it relates to the philosophical and psychological foundations of human communication, and so has relevance to any subject."[32] Cataloging is perceived as a sociological function of providing satisfactory access to the resources (MacPherson, 1939). Cataloging rules differ among cataloging systems, but the cataloging principles of organizing the resources are common to all types of libraries (Foskett, 1964).

(c) Provision of a full access to information resources is a major obligation of librarians in democracy. It relates to the dissemination of knowledge to the present clientele as well as to the preservation of library records for their dissemination to future generations of patrons.

Scholars now realize that "our culture, historically the most prolific in terms of paper records, could in two centuries well become a lost culture because little by way of permanent records would remain."[33] The same concern is now expressed about the newer media, such as videotapes, microfilms, and magnetic tapes.

The issues of preservation directly affect not only future dissemination of records but also their formats, indirectly influencing the changing structure of library information science itself.[34]

From the very beginning of library history, the preservation of records has been its primary responsibility, born, in the words of Shera, "of the coincidence of social need [for communication] and physical scarcity [of fragile graphic records]."[35] Until the introduction of electronic data, the interdependence between access to and the preservation of library material was almost mutually exclusive, requiring special arrangements such as closed stacks, or, later, duplication of frequently used materials and separate, restricted-use collections of rare publications. With electronic data gradually supplementing printed records, access is determined by the financial cost of electronic equipment and services available to the library, thus creating a new information-poor category of patrons.

#### 4.6.1.2 Purposes of Information Agencies

Librarianship has no purposeful mission of its own; it cannot initiate new purposes. But it can interpret the mission or purpose assigned to it by society (Reith, 1984), even though it lacks strong advocacy and at times it succumbs to aggressive special interests.

The purposes of librarianship are here defined as goal-oriented actions in terms of relationships between the library services (as dependent variables), reacting to its society's needs (as independent variables). Three basic end-objectives define library purposes: the informative, the educational and the cultural; and each, in turn, can be further subdivided into more specific actions.

### (a) Informative End-objective

The informational goal is twofold: to provide answers to specific questions, and to stimulate new questions by making patrons aware of the needed information. The latter goal is well illustrated by the essential role of communication in scientific research. Such communication requires a constant exchange of data on the changing status of knowledge. "The ultimate function of a sophisticated data bank would be to become part of the scientific process itself -- to anticipate scientists' information needs; to disseminate information created by the scientists in the community being served to other scientists outside the community on whom it would be predicted to have a significant impact; and even to generate information such as synthesis as a result of analyzing information flow and use."[36]

The overall goal of informative processes of LIS is to provide a description of resources available to the patron. Descriptions range from raw empirical data, to the material dealing with emotional as well as fictional descriptions of experiences, to tightly formulated theoretical treatises. In cases of controversy or a variety of opinions, the descriptions include objective representation of all viewpoints. All descriptions are subject to verification in terms of their relevance to the facts described.

### (b) Educational End-objectives

Educational goals of librarianship are seen differently by various writers. Boaz maintains that future librarianship must go beyond traditional requirements by knowing the content of books, and it must also be able to understand and communicate the ideas expressed in them (Boaz, 1972). John Cotton Dana (1906) considers the library as a public educational institution, a cultural center for the community. Important to him are specialized information services for scholars and readers considered as 'indexes' to total knowledge.

The role of the library in educational system was fully reviewed by the National Society for the Study of Education's committee chaired by Louis R. Wilson in 1941 (Henry, 1943). Library educational goals are perceived as independent and self-directed learning (Christ, 1972). For Johnson, the public library as a people's university strengthens culture through education, citizenship, Christianity, and democracy. It assists in job training and understanding of political, social, and cultural ideas of democracy (A. Johnson, 1938). Predeek (1939) wants to educate by creating an intellectual environment for the interpretation of cultural values, by providing reading material and by maintaining neutrality in responding to conflicting interests groups' needs.

An aggressive educational leadership is called for by Sherman (1939). The library is seen by Dewey, Dana, and Foss as a public institution, an extension of public education.

The political role of the library in education varies: from serving the needs of the government in totalitarian systems, to satisfying the informational needs of individuals in democracy. Objections to the educational function of libraries in democracy are based on its restrictive goal determined by the specific political system (Brown, 1940). The overall function is to educate the citizens in the prevailing cultural and political doctrine.

B. Landheer (1957) describes the medievalist attitude of library relations to education, as illustrated by librarians' efforts to fulfill two contradictory needs of reading, for recreation and for professional purposes.

Putnam considered education as a primary library function "to supplement, complement, and substitute for the schools."[37] The main means of education was the proper use of books to discipline human mind, by bringing order into chaos. Krieg (1970) pointed to a strong affinity of Putnam's views with those of his favorite philosophers. (a) Putnam advocated Jeffersonian intellectual aristocracy by promoting higher education for gifted individuals. (b) He subscribed to Locke's view that education ought to promote good habits, principles, virtue, and wisdom, reinforced by Horace Mann's belief in the essential importance of moral education for social survival. (c) With Kant, he believed that it is a basic duty of each individual to improve himself. Putnam shared with Francis Bacon distaste for 'inferior' books and endorsed Thomas Carlyle's stress on the importance of preservation of culture through books. As Eisner pointed out in the abstract of Krieg's report, Putnam's ideas about library functions were formulated before the philosophy of librarianship was developed, and they reflect less the views of other librarians than those of the philosophers popular at his time.

Dissemination of knowledge is the most direct expression of library educational purposes. It is performed by the librarian as a 'teacher' or as an advisor in the library that is viewed as a cultural center of the community, addressing all intellectual needs of the community.

Burke identifies four major processes involved in the dissemination of scholarship: (a) education in providing cultural materials to patrons, (b) consultation in the availability of needed material, (c) mass communication, by making the cultural material available, and (d) reference work providing the patron with the information asked for.[38]

Effects of library dissemination of knowledge are moral, social, and political. The existence of censorship is evidence of the significance of dissemination on influencing human behavior. In totalitarian systems, the library is seen as a tool in propagating the system's political ideas; in democracy it is used to educate the voters. Major support of public libraries by philanthropists and reformers is based on their belief in the significance of library contribution to the prevention of socially negative behavior. For example, a provision of material for 'amusement and recreation' in nineteenth century was designed to protect members of the working class from intoxication.

(c) Cultural End-objectives

Culture can be transmitted from one period or location to another only by recorded symbols of knowledge and ideas. Librarianship is concerned with the facilitation of that transmission. Butler (1943) lists four methods of transmitting knowledge: through (1) education (curriculum), (2) research based on individuals' experiences and observations, (3) consultation as a social communication, and (4) reference defined in terms of its function as a process by which civilized man can obtain specific information by using library collections.

Distinction is often made between purposive and recreational, cultural usage of a library. The use of the term 'recreational' function is, however, misleading. The library never was in the business of entertainment. It did, however, provide intellectual opportunities for activities that were mentally pleasing, or relaxing. The aesthetic role of the library in general, and the public library in particular, is to provide opportunities for aesthetic experience. Thus, for example, the purpose of encouraging recreational reading is to cultivate reading for pleasure, taste, and aesthetic enjoyment. The focus is on emotional or sensuous experiences.

Reading for pleasure, a pleasant library physical environment, library architecture, furniture, and library decor are elements OF the external aspects of library's aesthetic function. The kind of print used in books, their page arrangement, and their binding are examples of internal aesthetic aspects of LIS.

Some ancient libraries had decorations and statutes placed in and outside the library, partly as esthetic and partly as communicative symbols.[39]

### 4.6.1.3 Functions of Information Agents

The basic function of information professionals is to facilitate transfer of the meaning of the recorded message to its recipient (information transfer). This is accomplished by (a) the managerial coordination of library resources and services, (b) interpretation of resources, and (c) mediation between conflicting needs and available resources (intermediacy).

#### (a) Managerial Coordination

Librarians increase the social utility of graphic records by management of knowledge toward better understanding of the universe. Librarianship is a 'time-binder,' providing an interdisciplinary arrangement of knowledge by ordering, relating, and structuring graphic records. In this sense, it is closely related to general semantics; both are interdisciplinary, concerned with the utilization of information; both are parts of communication chain, its language, symbolism, abstractions, conceptualizations and evaluation; and both are epistemological (Shera, 1961).

### (b) Interpretation of Resources

The interpretative role of librarians is based on what Fairthorne calls patrons' ignorance about things they want to know. "This ignorance makes the librarians' task possible . . . to help the reader to find out what people have to say; not to expound to the reader what has been said, as a substitute for the author; not to make use of what has been said, as a substitute for the reader; not to tell the reader what he ought to read, as a substitute for God."[40]

The essence of interpreting library resources is the establishment of interrelationships between records and their informative content relevant to the user's needs. Fully developed interpretation for nonspecialists would set documents in context in the same way that the documents are consulted by specialists. Thus, librarians here substitute for the knowledge of the subject specialist.

### (c) Mediation between Demands for and Supplies of Resources and Services

The task of a reference librarian is to act as an intermediary between the inquirer and the library information system. This is accomplished through neutral questioning in 'query negotiation'. Dervin and Dewdney's model (Dervin and Dewdney, 1986) is a strategy for asking questions to understand the user's needs for information. The authors distinguished between traditional, or closed, and new, or neutral, questioning methods. In closed questioning, reference librarians look for direct yes/no answers to their specific questions, and then direct the inquirer to the specific author, title, or subject area in the collection. By asking a direct question, the librarian prejudges the need. On the other hand, a neutral questioning approach requires listening, thus inviting patrons to talk more about their needs.

This approach, according to Dervin and Dewdney, is based on three elements: (a) situation, based on requesters' background, which determines the way they perceive the issue, and a context for the information needed ("Why do you need it?"); (b) the information gap, which is expressed by the question asked ("What would you like to know?"); (c) the anticipated use made of the answer provided by the reference librarian ("How do you plan to use the information?"). Information seeking is a 'sense-making' for a particular situation. Thus information is not a commodity that can be stored, accessed, retrieved or transformed. Neither is it "intrinsic in the data . . . Rather, the value for the user is a function of the way the data satisfy that person's needs."[41]

The same information may be of different value to the same person in different situations. "Information does not have an independent existence, but is rather a construct of the user." [42] In such an approach, Swigger notes, libraries become storehouses of answers to questions, not just storehouses of recorded knowledge. It is a shift in focus from collections to their use, with questions asked indicating the need for information.[43] Swigger illustrates the change by suggesting research questions: What are information needs? How they can be articulated? What are the available resources for satisfying these needs? What is the initial impetus for the patron to ask the reference question in the first place?[44]

Effective conversion of information into knowledge requires that "each document be studied within the universe of all other documents on the same subjects, that it be weighed, assigned status . . . and provided with a position . . . within the existing canons of scientific knowledge."[45] Descriptors assigned to a given document include ideology governing a document, its perspectives (e.g., a conflict or a consensus), its school of thought and its methodology (e.g., synthetic or analytical).

Abstracting services are of value for providing information, rather than for their referential potential. Encyclopedia articles, state-of-art reviews, catalogs, indexing, abstracting, and bibliographies are not by themselves sufficient for providing adequately revealing statements, they do, however, provide specific items of information.

### 4.6.2 Informational Environment

Shera emphasized the importance of social environment of the library, especially the public library, by insisting that the library is a social agency, rather than social institution. "The distinction is fundamental to complete understanding of the relation between the library and its social environment. Whereas the social institution is primary and basic, the social agency is secondary and derived . . . The one determines the pattern of society, and the other is determined by that pattern. The agency is the instrument of the institution, and by means of it the institution exercises much of the social control. Thus, the distinction . . . involves a flow of power and authority.[46]

All libraries are directly affected by their cultural, professional, and technological environments. Each significantly influences the effectiveness of library fulfilment of its primary responsibilities.

Taylor, in order to bridge the gap between the information environment and the information users, focuses on an 'information use environment', to "organize what we seem to know about the environment within which different types of users seek information available to them."[47]

He concentrates on three types of information transfer, affected by the information environment: technological (what is stored in the book or computer), content-driven (how the information is stored and organized), and user and use information (the context within which the user makes decisions about information useful to them).

In this section three types of information environment are identified and discussed: cultural, political, and technical.

### a. Cultural Environment

Burke defines culture as "the mode of living by which a community exploits the human possibilities of its environment."[48] It consists of material, social, and intellectual components. The intellectual content of a culture in librarianship is manifested in scholarship about factual knowledge, ideas, values and opinions; many of them are expressed in the recorded experiences of that culture. "Scholarship is for a society what memory is for an individual", Burke continues, ". . . a social memory of communal experiences, that is built up and transmitted by successive generations."[49] It is made up of technology of the means, the social organization of environment, and the intellectual curiosity about the meaning of experiences. One of the products of scholarship is a generic book, either presenting or representing the ideas and experiences. The former are the scientific texts, describing or symbolically representing the experiences, and the latter are the literary texts of imaginary experiences.

b. Political Environment

Political environment is here reviewed on two levels: external reflecting society's expectations, and internal, formulated within the society's professional organizations.

Political aspects of cultural environment are illustrated by library dependence on governmental support. Prior to 1850, for example, public, tax supported libraries did not exist in the United States. They were preceded by subscription libraries, voluntary associations of individuals for buying books in a jointly owned organization. The arrangement worked well, as long as individual support lasted. It was eventually replaced by tax-supported public libraries.

Here are some of the positions on political aspects of library environment, expressed by librarians representing different political viewpoints. Kolitsch (1945) called for a socio-political philosophy, compatible with national philosophy concerning reader-book relations. Wellard (1934) and MacLeish (1940a) wanted a philosophy of librarianship in support of democracy. Danton (1934) argued for political involvement to assist in developing well-informed citizens who could adjust to a changing environment. Joeckel with Winslow (1948) considers the library as an organ of social democracy instrumental for the patron's self-realization. To Laski (1935) the library was a nucleus of social changes which are based on cultural heritage. Ortega wanted the library to be a policeman of ideas, by rejecting those he did not agree with (Rogers, 1984).

On the other side of the political spectrum, Lenin introduced the socialist library system, subordinating library work to the political, economic, and cultural goals of the country. N. K. Krupskaia expressed a Marxian view of librarianship and its importance in classification of library resources. In her 1968 paper she described the library as a policeman of ideas, selecting books in Marxist philosophy and aiming at a scientific view of the world in agreement with its materialistic and atheistic trend. This approach was reflected in cataloging and in subject headings used in Russian libraries.

The professional status of the library in its society is reflected by an image of its role held in the community. Concerns about the 'good' image are motivated by a need for respectability. Some of the efforts in this respect, however, show a lack of confidence in the librarian's own profession, as illustrated by linking librarianship with better established professions such as medicine or teaching.

Librarians' professional requirements include scholarly background in a pursuit of truth, humanism reflected by sensitivity to community needs, and involvement in education by fighting mediocrity. However, library education, lacking philosophical context, tends to produce well-trained technicians rather than professional information specialists. Overlapping librarian and paraprofessional responsibilities add to the confusion by considering some activities as paraprofessional, assigning non library-degree holders 'librarians' function. "There is a paradoxical relationship between the standards of librarianship and library service established by library associations, on the one hand, and conditions of work as they exist in most libraries, on the other. Like many other technical and semiprofessionals, librarians possess normative standards that define how work is to be done but lack the legal authority and economic power of the established professions to enforce those standards on the job."[50]

Another example of the professional dilemma in librarianship is the issue of professional neutrality. Essential in any mediating process, it is a highly controversial and misunderstood concept. Argument in favor of neutrality is based on 'no religion, morals or politics' in the performance of professional responsibilities (Foskett, 1962). Librarians' function is not to improve patrons' personalities, but to provide them with the opportunities, which may or may not be taken advantage of. Individuals must decide for themselves what they consider good or desirable.

On the other hand, Archibald MacLeish (1940) maintains that the librarian as a consultative agent of democracy, cannot be neutral. Ogilvie (1940) is against impartiality and for shaping public opinion. Broadfield takes a middle road by arguing that impartiality is a quality of a divine being, not of a librarian, and represents an ideal for a researcher. It is an attribute of personal judgment, not of a social institution, thus a library cannot be an 'impartial instrument of purposive society.' It is neither partial nor impartial, but it simply responds to social forces that determine its role.[51]

This is a paradox created by the expectation of political neutrality within a given cultural system, contradicted by the demands for political advocacy expressed by competing interest groups within that system.

The issue of neutrality is also a part of professional ethics. Ethical obligations include rules of conduct against prejudice, censorship, and operational errors, and for objective selection and services of library resources. It reflects social consciousness, respect for intellectual, moral, and spiritual values of individuals and their communities. However, librarianship is also a product, not a base of society, and hence is a subject to changing social ethical standards.

### c. Technical Environment

As already pointed out, there is a very close relationship between the state of technology and cultural activities of the library. Burke (1953) illustrated this interdependence by enumerating five similar functions associated with the changes in the technology of communication throughout the history: (1) ancient mnemonic methods such as knotted cords are today replicated by various memory aids; (2) the prehistoric picture, like today's photograph, recorded single events; (3) pictographic (iconographic) writing, similarly to cartoons, provided visual descriptions of series of events; (4) ideographs (hieroglyphs) recorded fixed meaning for ideas, in the same sense that today's red traffic lights communicate the order to stop, since ideograms "stand for ideas suggested by the things represented rather than for the things themselves;" [52] and (5) phonetic symbols, similarly to electronic codes in the computer, represent the specific sound of a language. Yet the concept of symbolic communication remained the same although the technology of communicating the ideas vastly improved.

The development of the tools for recording messages depends not only on the changes in available technology, but also on society's willingness to accept them. Changes in the ways of communication are cumulative rather than successive. Once recorded, in whatever format, the messages become of prime interest to the librarian.[53]

### 4.6.3 Role in Society

The conceptual interpretation of an information agency's role in its society is here briefly reviewed in terms of (a) the psychological aspect of satisfying individual information needs for self-improvement of the patron, (b) the sociological educational need of the society, and (c) the philosophically based task of mediating between these two often-conflicting individual and social needs.

(a) Psychological Evaluation

The fundamental purpose of librarianship is to serve individual patrons and, through them, the society. Individuals are distinct and unique members of the library population, each requiring special consideration. This service is accomplished by transmitting society's knowledge to individuals through recorded messages and by understanding the relationships between the individual patron's use of library resources and the nature of these resources.

(b) Sociological Evaluation

The general social function of librarianship is to provide cultural continuity by preserving and expanding the collective social memory. This is done by providing access to cultural, informational, and historical records.

The social functions of the library are defined by the relationships between the producer (author), the distributor (library), and the consumer (patron). The library is always an 'expression of its age' in the kind of services provided and in its mediation between conflicting group interests, always in terms of the perceived interest of the society.

To Peirce (1951) it is based on a sociological philosophy of education, which in turn is a goal of the librarians to contribute to the creation of a learning society (Chisholm, 1985). It is identified with 'culturalism,' which is based on the understanding of the nature of scholarship and its role in civilization (Butler, 1944).

### (c) Philosophical Evaluation

Philosophical evaluation of the library's role in a society should express the meaning of library services as an assistance to people in their interactions in informational marketplace (Nader, 1974). Shaped by society, library services reflect group interest, conflict, and relativism (Kolitsch, 1945). Dana argues that the library provides a reconciliation for group conflicts, based on tolerance and dedication to intellectual service, and that it expresses social responsibility by objective social advocacy (Berminghausen, 1972). It offers spiritual and religious interpretation of information, promotes an international viewpoint, contributes to scientific objectivity, and resists prejudices (Burke, 1947).

In this essay, philosophical interpretation of the discipline is expressed by an ideal model, combining the pragmatic issues of managing and servicing information needs with theoretical explanation of the subject matter of the discipline, "Librarianship is rooted in epistemology -- knowledge about knowledge."[54] It is an interdisciplinary field focusing on the management of knowledge contained in the records of library collections. And because of that, Shera maintains, librarianship must be concerned about philosophy of knowledge.

## 4.7 Summary.

The common mission of all libraries is to serve as an intermediary between individual needs for information and the records containing information. This mission did not change throughout history, in spite of changing technology and social conditions. MacLeish (1972) calls it the transfer of meaning. He defines a book as a report upon a mystery of existence; it interprets the signs and provides knowledge about ourselves and the world. Therefore, librarianship is more than storage, organization, and dissemination of records. It provides a total relationship, a wholeness of different individual records, covering different fields and different times in different cultures.

The library as an intellectual node in the interdependence of individuals in the society provides different library services to different populations and individuals with different backgrounds. All libraries share in common a responsibility for preserving past and present records of the society, and for protecting their intellectual, social, and philosophical expressions of freedoms. The major difficulties in formulating a theory of

librarianship that would incorporate both the precision of the scientific method and the well-defined bibliographical and informational scope of the subject matter are twofold:
(a) a thoroughly practical approach in library operations defies generalizations by creating too many exceptions to the established rules; and (b) the widespread application of these operations resists theoretical definition of their knowledge base.

Hence the theory of library science must be: (a) necessarily flexible, so that it can respond to the variation in the nature of demands on library services; (b) sufficiently broad, so that it can accommodate the findings of specific disciplines; (c) logically consistent to assure a degree of uniformity in the formulation of general principles of library science; and (d) satisfactorily defined, so that it distinguishes library science as an autonomous discipline.

## NOTES

1. Irwin, R. (1961). "Librarianship." In T. Landau (Editor.), *Encyclopaedia of Librarianship* (2d). London: Bowes and Bowes.

2. Ibid., pp. 199-200.

3. The study focused on a newly developed doctoral program in information science at the State University of New York at Albany. It surveyed the opinions of some faculty members directly involved in the initial development of the program. The small size of the survey limits its results only to the university sampled, but its conclusion reinforces the generally perceived need for further study of the subject. (Nitecki, 1989-b)

4. Schrader, A. M. (1983). *Toward a Theory of Library and Information Science*. Unpublished doctoral dissertation, Indiana University, Bloomington, Indiana, pt. 1, p. 319.

5. This section is based on the critical review of philosophical interpretations of definition by Raziel Abelson (1967). It is limited here to applying Abelson's distinctions to the definitions of librarianship.

6. Abelson, R. (1967). "Definition." In Paul Edwards (Editor in Chief), *The Encyclopedia of Philosophy* (Reprint edition, 1972). 2 (pp. 314-324). New York: Macmillan Publishing Co., Inc. & The Free Press, p. 317.

7. Ibid., p. 319.

8. Ibid.

9. Ibid., p. 321.

10. Ibid., p. 316.

11. Schrader, 1983, op. cit., pp. ii-iii.

12. To avoid reinventing the wheel, Schrader's study is here reviewed in some detail, since it provides a comprehensive textual analysis of practically all definitions of the field, printed before the completion of his study. However, the review itself is selective, and the reader is refereed to the original dissertation for a full exposition of Schrader's thesis. See also his abbreviated version of the definition of information science, published in 1986.

13. Schrader, 1983, op. cit., p. 16.

14. Ibid., pt. 1, p. 31.

15. Ibid., p. 85 passim.

16. Ibid., pp. 119-121.

17. Hayes, R. M. (1969). "Information Science in Librarianship." *Libri*, 19(3), p. 221.

18. Schrader, 1983, op. cit., pt. 1, p. 379.

19. Ibid., pt. 1, p. 330.

20. Ibid., pt. 1, p. 328+ .

21. Schrader defines praxiological inquiry as "the evaluation of instrumental worth . . . How effectively can the user obtain the sought symbolic culture? The extent to which access is facilitated by the system is thus indicated" (Schrader, 1983, pt. 1, p. 377).

22. Schrader, 1983, op. cit., pt. 1, p. 386.

23. Abelson, 1967, op. cit., p. 32.

24. Ibid., p. 317 .

25. Lakoff, G. and Mark Johnson (1980). *Metaphors We Live By*. Chicago: The University of Chicago Press, p. 239.

26. Stight, T. G. (1979). "Educational Uses of Metaphor." In Andrew Ortony (ed.), *Metaphor and Thought*. Cambridge, England: Cambridge University Press, p. 479.

27. What follows is my summary of Wilkinson's argument that library science studies how to identify and classify 'containers of information.' Information science 'filters' information itself, i.e., it screens total information for specific information that is relevant to the user.

28. Kaske, N. K. and James E. Rush (1980). *Library and Information Science Research*. Chicago: American Library Association (quoted after Wilkinson).

29. Snyderwine, L. T. (Summer 1981). "The Philosophy of Recording Knowledge." *Journal of Educational Media Science*, 18(4), p. 29.

30. Wilkinson, J. (1983). "The Legitimization of Librarianship." *Libri*, 33(1), p. 42 (also quoted by M. A. Wilkinson).

31. Wilkinson, M. A. (August 1984). "Three Hypotheses." *Canadian Library Journal*, 41(4), p. 200.

32. Foskett, D. J. (1973). "The Contribution of Classification to a Theory of Librarianship." In C. H. Rawski (ed.), *Toward a Theory of Librarianship*. Metuchen, N.J.: The Scarecrow Press, p. 183.

33. Power, E. (1976). "O-P Books: A Library Breaktrough."In A. B. Veaner (ed.), *Studies in Micropublishing 1853-1976.* Westport, Conn.: Microform Review Inc., p. 331.

34. "The history of the written word has gone full circle: from the single manuscript copy to the limited editions of the early printers; to the big editions of modern printing technology; to the smaller editions of offset and mimeograph; and back to the single edition of the O-P Book. For the first time, through the proper use of 35mm microfilm, the full history of our culture can be preserved and stored at low cost and, when copies are needed, they can be produced in any desired quantity at rates scholars can afford" (Power, 1958, op. cit., p. 334).

35. Shera, J. (1972). *The Foundations of Education for Librarianship*, New York, Becker and Hayes, p. 136.

36. Garvey, W. D. (1979). *Communication*: *The Essence of Science. Façilitating Information Exchange Among Librarians, Scientists, Engineers and Students*. Oxford, New York: Pergamon Press, p. 120.

37. Krieg, C. J. (1970). *Herbert Putnam's Philosophy of Librarianship as Reflected in Selected Writings.* Unpublished doctoral dissertation, Long Island University, Brookville, N.Y., p. 115.

38. Burke, R. A. (1953). *Culture and Communication Through the Ages.* Preliminary edition (manuscript), pp. 43-44.

39. The library in Assurbanipal had a bas-relief of Dragon, the fish god, relating library to religion; Pergamon had figures of ancient philosophers; and Prusa had other sculptures represented Episteme (Knowledge), Arete (Virtue) and Sophia (Wisdom). Stained glass was introduced in the 9th century for the religious purpose of creating a visual sermon, represening the metaphorical light of knowledge. It was replaced in the twentieth century by electrical lights (Orr, J. M. (November 1, 1977). "Libraries as Communication Systems" (Review), *Information Hotline*, 9(10), 27.

40. Fairthorne, R. A. (1973). "The Symmetries of Ignorance." In C. H. Rawski (ed.), *Toward a Theory of Librarianship.* Metuchen, N.J.: The Scarecrow Press, p. 263.

41. Walker, Donald. (Sept., 1981) "The Organization and Use of Information: Contributions of Information Science, Computational Linguistics, and Artificial Intelligence." *Journal of the American Society for Information Science*, 32, p. 356 Also quoted by B. Dervin, B. and P. Dewdney (Summer, 1986). "Neutral Questionning: A New Approach to the Reference Interview." *RQ*, 25(4), p. 508.

42. Dervin, 1986, op. cit.,p. 507.

43. Swigger, K. (1985). *Questions in Library and Information Science*, p. 369.

44. Ibid., p. 381.

45. Bergen, D. (January 1978). "Use of Social Science Literature" - Review. *The Library Quarterly*, 48(1), p. 90.

46. Shera, J. H. (1949). *Foundations of the Public Library; The Origins of the Public Library Movement in New England, 1629-1855*. Chicago: The University of Chicago Press, p. 5.

47. Taylor, Robert S. (1991) "Information Use Environments." In *Progress in Communication Sciences*, ed. by Brenda Dervin and Melvin J. Voigt, v.x. Ablex Publication Corporation, p. 219.

48. Burke, 1953, op. cit., p. 35.

49. Ibid., p. 37.

50. Reeves, W. J. (1980). *Librarians as Professionals; The Occupation's Impact on Library Work Arrangements.* Lexington, Mass.: Lexington Books, p. xix.

51. Broadfield, A. (1949). *A Philosophy of Librarianship.* London: Grafton, p. 76.

52. Burke, 1953, op. cit.,p. 18.

53. Ibid., pp. 7-22.

54. Shera, J. H. (1965). *Libraries and the Organization of Knowledge.* Hamden, Conn.: Archon Books. (Edited and with an Introduction by D. J.Foskett. Few modifications of the original text made by the editor), p. 176.

# PART II:
# DEFINING REALITY: Philosophical inquiry

> It may seem strange that so many exceedingly intelligent persons are wholeheartedly devoted to a profession in which the main goal is to come up with creations with which their colleagues try to find fault . . . you may understand why great minds find this endeavor fascinatingly challenging--to wrestle from nature her secrets and formulate them in such simple and comprehensible language that they are indisputable.
>
> William Garvey [1]

## CHAPTER 5:
## CONCEPTUAL FRAMEWORK

> Philosophy matters . . . philosophical ideas that have developed over the centuries enter our culture in the form of a world view and affect us in thousands ways . . . the conceptual frameworks upon which entire academic disciplines rest usually have roots in philosophy -- roots so deep and invisible that they are usually not even noticed.
>
> George Lakoff [2]

### 5.1 Introduction

Library collections of records, however defined, are among the basic concepts in LIS; they describe various aspects of reality. The concept of reality itself, similarly to that of infinity, has no conceptual limitations. The more complex the definition of its scope, the less intelligible it is; the more limited and specific its content, the less concrete is its meaning. In the broadest sense, reality is the totality of all existence, including the knowledge about it. We learn about reality by studying that knowledge. "Without this study, the librarian or information scientist is like a surgeon practiced in operational techniques and equipment, who knows nothing of the structure of the bodies on which he operates." [3]

The nature, scope, and meaning of reality and knowledge are among the basic issues addressed by philosophy. "Philosophy . . . is something intermediate between theology and science. Like theology, it consists of speculations on matters as to which definite knowledge has, so far, been unascertainable; but like science, it appeals to human reason rather than to authority, whether that of tradition or that of revelation."[4]

Science focuses on the known reality, reducing our ignorance about it; religion addresses a much larger and unknown universe, which is a source of never-eliminated uncertainty.

Philosophical inquiry, motivated by intellectual curiosity, probes either of the above two approaches. "When we ask 'why?' concerning an event, we may mean either of two things . . . 'What purpose did this event serve?" or . . . 'What earlier circumstances caused this event?' The answer to the former question is a teleological explanation, or an explanation by final causes; the answer to the latter question is a mechanistic explanation." [5] Teleological answers are rooted in the religious notion of purpose. In time, teleological interpretations of reality lead to a metaphysical concept of the intellectually perceived form and essence of absolute reality and ethical considerations of value.

The mechanistic answers relate to observable and verifiable scientific speculations and become a scientific method for systematic empirical verification of the hypothetical definition of reality.

### 5.1.1 Philosophical Overview

A brief philosophical discussion may be helpful for better understanding the theoretical writings in librarianship. Some contemporary writers on intellectual aspects of librarianship based their arguments on philosophy, implying close affinity between the two disciplines.

Better appreciation of philosophy provides an insight into the rationale for library operations. In the last few decades, with the 'information explosion,' a philosophical analysis of the library's role in society may contribute not only to a better response to society's needs but also to a more effective delineation of the library's leadership role in defining those needs.

On the surface, philosophy is everything to some people and nothing to others. That is so partly because of its complex and broad subject matter, which covers issues that are essential, but not directly obvious, to all of us. In librarianship, philosophy provides an opportunity to formulate a meta-inquiry about research into basic concepts of the discipline. For example, epistemology may provide a critical examination of library classificatory schema, metaphysical discussion can offer an insight into the essence of the discipline, logic serves as the methodology, and ethics formulates the code of behavior for library staff and patrons, while aesthetics has its impact on the library's internal ambience.

Today, philosophy is often perceived as a systematic attempt to understand knowledge and its ultimate nature. It offers rational explanation and criticism of theories about the universe around us.

### 5.1.2 Major Philosophical Questions

The scope of philosophy can be described in terms of questions, for which one seeks philosophical answers.

Epistemological questions relate to the nature of the discipline; they provide critical analyses of its paradigms by asking: How did librarianship originate as a discipline? What was the impact of the culture on its emergence and growth? What are its structure and validity? and, What is its methodology?

Metaphysical questions reflect on the essence of the discipline, its root meaning, the substance of information carriers, and their content.

Ethical questions are concerned with the judgment of approval-disapproval, rightness-wrongness, goodness-badness, or desirability of action, as they apply to librarianship. Ethics is subdivided into (a) axiology dealing with judgments of value (e.g., the statement 'knowledge is good') and sociological or psychological explanations of that judgment, and (b) deontology, a judgment of obligation (e.g., the statement 'knowledge is desirable').

Aesthetics addresses issues related to beauty and to pleasant-unpleasant feelings aroused by various stimuli for their own sake. As already noted, it applies to the arts and their products, from an aesthetics of library environment to the format of printed books and their binding.

Logical questions deal with the theory and principles of reasoning that enable an individual to make a judgment or to draw conclusions which are consistent with the data at hand. The logical approach describes the processes involved in thinking, with special reference to the validity of conclusions drawn from premises as in decision-making processes.

## 5.2 What is Philosophy ?

Since the definition of philosophy is itself a philosophical issue (Lewis, 1981), the multiplicity of its ramifications becomes almost an unsurmountable problem. Anyone can select any issue, within or outside philosophy proper, and define its meaning or criticize its interpretations by selecting some axioms of philosophy as the bases for the discussion.

"Philosophical problems arise when men ask questions . . . which, though very diverse, have certain characteristics in common;" they tend to be general, involving issues of principles, with little if any concern about their practical utility, and they are neither empirical nor formal.[6] Their "generality, obscurity, and, above all, apparent (or real) insolubility by empirical or formal methods gives them a status of their own which we tend to call philosophical." [7]

Philosophical method is a critical speculation about things, facts, events, and ideas about them. Various approaches were developed at different times, in a variety of environments, none within any predefined format. Each approach contains some elements of different schools of thought.

## 5.3 Evolution of Philosophical Interpretations of Ultimate Reality [8]

Reality denoted the totality of human experiences of things, event, or ideas, whether conscious, unconscious, intuited, or imagined. The major philosophical problem lies in distinguishing between experiences of something that actually exists, looks as if it exists, or gives the appearance of existing. The experience of 'actual' existence assumes an undeniable fact of existing, (e.g., 'this datum is wrong'), while the 'seeming' existence may be a subjective perception of apparent existence (e.g., 'this datum seems inappropriate in that context'). Therefore, the experience of something that appears to exist to an observer may not be the same as the 'something' itself (Kant's 'thing-in-itself' illustrates the difference between the description of an event in a book, and the event itself). The 'seeming' idioms express the noncommittal probability of existence; the 'looking' idioms (appearance) describe the experience based on incomplete knowledge of 'something' experienced, hence differing from real existence.[9]

The distinction between appearance and reality is a philosophical cornerstone of Library Information Science, as defined in this book. The library provides records of knowledge in response to specific requests. Its service is satisfactory only to the extent that it provides data, information, or knowledge describing the kind of reality that the patron had in mind. The appreciation of the different ways reality can be perceived by library patrons seems to me to be the essential factor in providing effective assistance to them.

The records available in the library collection do not by themselves change reality. They describe its selected aspects, and in this sense they do, or may, change the perception of that reality. Therefore, indirectly, library records share, by means of the 'knowledge' they contain, the power to alter reality or its perception.

The review of the historical interpretation of reality confirms the assumptions of this study, that no ideas exist in isolation, and that the most basic concepts, debated a long time ago, are still of importance to us today.

The diagram below outlines major phases in development of definitions of reality. It began with the history of Indian

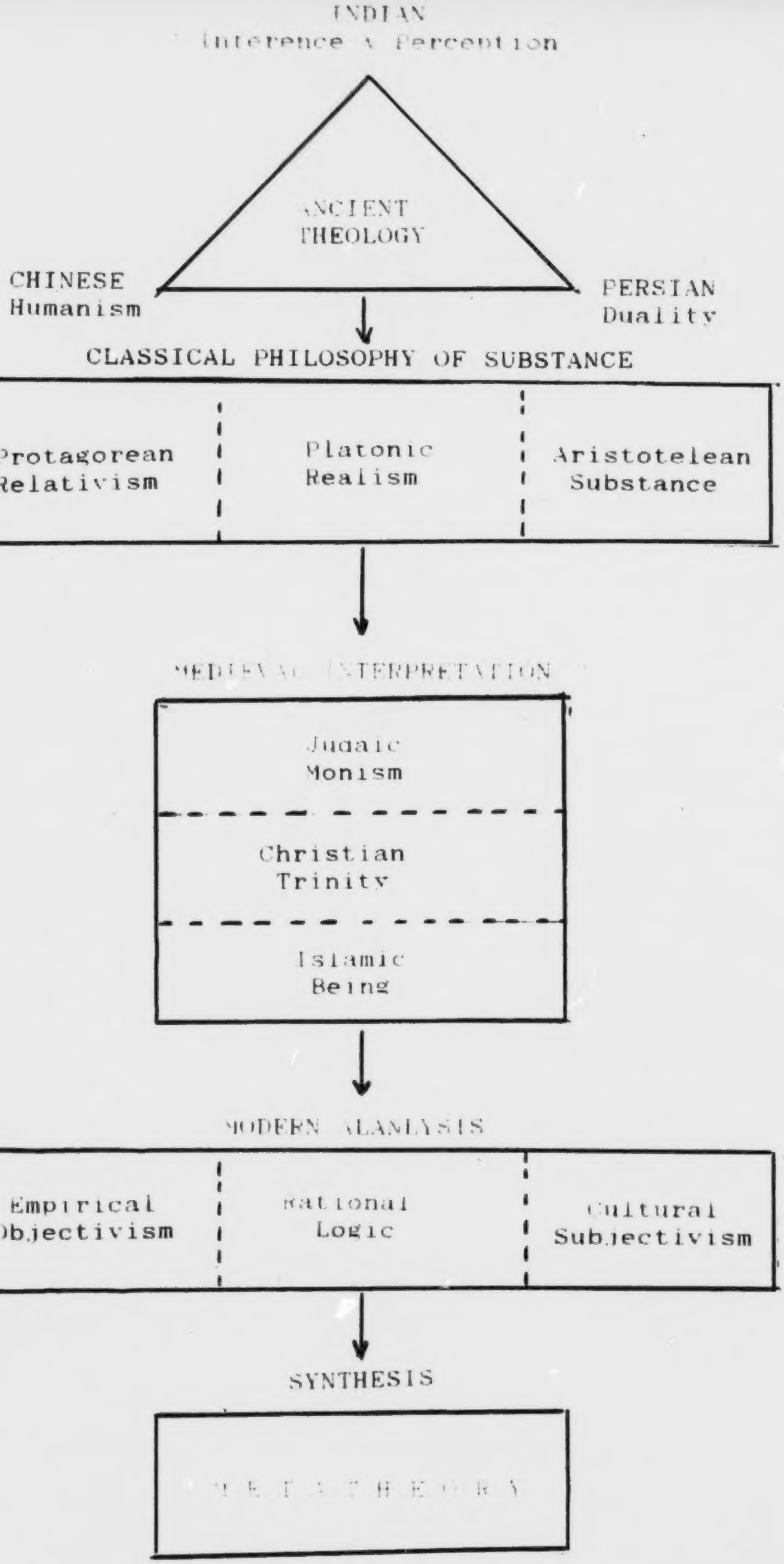
INDIAN
Inference & Perception
ANCIENT
THEOLOGY
CHINESE
Humanism
PERSIAN
Duality
CLASSICAL PHILOSOPHY OF SUBSTANCE
Protagorean
Relativism
Platonic
Realism
Aristotelean
Substance
MEDIEVAL INTERPRETATION
Judaic
Monism
Christian
Trinity
Islamic
Being
MODERN ALANLYSIS
Empirical
Objectivism
Rational
Logic
Cultural
Subjectivism
SYNTHESIS
METATHEORY

FIG. 5-1: AN OVERVIEW OF HISTORICAL INTERPRETATION OF REALITY

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(Hindu) thought which is "perhaps the earliest recorded thought of man. Its four thousand-odd years of history . . . [embrace] the multitudinous phases of intense inquiry"[10] which, with Chinese and Persian ways of thinking, constitute the pre-philosophical, theological stage of speculations about the universe. From Indian theology we have inherited the concepts of a perception of reality that ensues from sensory processes, and of inference, which allows for connecting an assumed nature of reality with one believed to be so.

Chinese cultural influences can be summarized by the Confucian humanistic focus on the individual's own nature, and Taoist naturalism in teaching nonaction, allowed Nature to take its own course through the process of unending transformation (Chan, 1967).

The Persian teaching's of Zarathustra gave us the concept of dual reality: good and evil, two independent and mutually irreducible substances in constant competition with each other.

Philosophy proper began with the so-called classical period of the Greeks' reflective analysis of reality. While Thales questioned its nature, Protagoras defined the concept of relativism in pronouncing that man is the measure of all things, although all man knows is what he perceives to be the reality, not the reality itself. Socrates initiated ethical philosophy, and Plato, the first epistemologist, introduced the notion of universal reality, an idea of essence which precedes the actual reality of experience. Aristotle, in his *Metaphysics*, combined physical matter with platonic essence (form) in the concept of substance, which is subject to changing status between potential and actual reality.

Traue argues that the essentials of information science originated in the classical period of philosophy, five thousand years ago. Summarizing the argument of another anthropologist, Traue states "that once the myths, the histories, the genealogies, the chronologies, the cosmologies were written down it was possible to make sustained comparisons, and with comparisons came an awareness of conflicting versions of events and a determination to discover the real truth."[11]

Medieval philosophy searched for conceptual solutions to philosophical problems in monasteries, cathedral schools, and newly emerged universities. The movement known as Scholasticism represented the Christian viewpoint, based on Platonic and Aristotelian philosophy and logic. Its philosophy, Judaic tradition, and Moslem teaching mutually influenced each other.

"In the context of mediaeval culture, the chief importance of Jewish philosophy lies in its mediating function between Muslim and Christian thought."[12] All three religions attempted to relate their teaching to philosophy. Jewish commitment to revelation as a prerequisite for any philosophical system reinforced the concept of monism that there is only one ultimate reality. Islamic philosophy introduced the concept of contingent and necessary being, an eternal essence of reality which requires absolute obedience to it. And Christian philosophy interpreted reality in terms of the trinity of God, as 'one in substance and three in embodiment,' implying that the nature of reality is based on one fundamental universal and a number of particulars defined in terms of that universal.

Modern philosophical analysis, from the Renaissance to the present century, can be roughly divided into three major groups: (a) empirical, focusing on the actual facts; (b) rational, logical, and metaphysical, emphasizing the intellectual aspects of reality; and (c) cultural and subjective, stressing intrinsic values of society.

Reflecting on the overall pattern in the history of philosophical interpretation of reality, one is overpowered by the variety of approaches and interpretations. The microcosm of that intellectual universe is represented in the collections of recorded ideas in libraries, which by means of their classification systems, provide some relational order for the many interpretations of reality.

The brief summary of different philosophical viewpoints presented here is admittedly polemic and retrospective. The discussion of different schools of thought is selective, not only to accord with space limitations, but also to focus on specific philosophical issues relevant to the theme of this book, the interpretation of reality in librarianship. Many of contemporary biases or convictions can be traced to the subconscious origins of their philosophical heritage.

The philosophical environment of the past is interpreted from the contemporary vantage point. The approach is vertical, tracing the changes in intellectual trends, rather than horizontal, analyzing in depth issues pertinent to the historical period reviewed.

### 5.3.1 Antiquity: Setting the Stage: Indian, Chinese and Other Philosophical Teachings (ca. 800 BC - 600 BC)

This pre-philosophical period is characterized by a struggle between mystical experiences of unknown reality and the need for a common-sense explanation of the mysteries of life. Emerging religions identified most of the major philosophical issues: from realistic and idealistic interpretations of direct experiences and indirect perceptions of reality, to the conflicts between individual needs and social ethics.

(a) Indian (Hindu) philosophy can be divided into three major periods:

- (1) 800 BC - 400 BC, scriptorial traditions expressed by chants, and pre-logical symbolic poetry, known collectively as Vedas.
- (2) 400 BC - AD 600, Sutras, the aphorism, developed for mnemonic reasoning, followed by philosophical treatises, called Upanishads.
- (3) 600 -1600: more advanced philosophy of Jainism detailed systematization of traditional teaching,

identifying inference, perception and testimony of past writings as the sources of knowledge (Smart, 1967).[13]

The earliest recorded thoughts expressed in Vedic sacred chants offered what were probably the first philosophical insights into the universe. They developed later into a pantheistic belief in one reality and finally emerged in modern philosophies of monism and idealism. Vedic chants indicate that man interpreted life as a concrete experience, searching for means to free himself from suffering. It was not an 'other-worldly' philosophy, since it assumed that there is no other world. It related to external, natural phenomena and nature worship based on a god-dependent, monistic belief in the single primal cause as creator of the universe.

Upanishads, the first philosophical writings, consisting of some hundred treatises, rejected Vedic pantheism and focused on the knowledge of the ultimate truth, 'looking within' for the reality of the universe. By asking the question "What is Brahman?" (i.e., what is the secret power in nature), they began the search for a single principle that defines all reality.

Followed by a common-sense philosophy based on common experiences, the new generation of religious thought and the philosophical school of Jainism believed that things have no transcendental essence: they are what they appear to be since perception is the only source of knowledge. Jainist metaphysics was both dualistic and pluralistic: the animate and inanimate in the universe were both considered eternal, independent and numberless. "Every proposition is held to be only partially real or unreal or both real and unreal from different points of view."[14]

Buddhism (ca. 400 BC) expresses a revolt of reason against the transcendentalism of Upanishads, "At every moment, everything is changing itself into something else, and identity is only an illusion. Even the Self is defined as a continuous succession of ideas . . . External objects are . . . unique particulars. Universals are dismissed as ideal superimposition upon the object."[15]

Eventually, Indian philosophy was organized into several systems together representing the multivaried interpretations of the universe. Among the most famous were:

-- Realistic and pluralistic approaches of the Nyaya and Vaisesika who acknowledged the external world as independently real, with no other substances such as water or earth to be considered the ultimately real. Universals of qualities, such as odor or sound, were also fully recognized as separate realities. The physical universe consisted of numberless and unique atoms. Nyaya-Vaisesika epistemology was both realistic and metaphysical: knowledge is obtained directly by perception. The inference, formulated indirectly, is an analogy; its test is its practicality, its essence is the correspondence. The ultimate human goal is achieved through transcendence of pleasure and pain after death.

-- The Sankhya-Yoga advocated a dualistic recognition of two independent ultimate principles: the transcendental, inactive, and unchanging essences of the conscious state, and the unconscious, active, and ever-changing essence of everyday life. Highest knowledge is an intuitive discrimination between these two ultimate principles.

-- The Mimamsa provided systematic investigation and reflection, about both the pluralistic soul and realistic material ends. Reality is "identity in difference," consisting of five categories: substance, quality, action, universals (both abstract and concrete), and nonexistence. "Knowledge is a changing activity of the Self, which, in knowing, manifests itself as . . . an object."[16] Whereas the objects are known directly, the self is known indirectly.

-- Indian philosophy culminated in The Vedanta, an absolutistic belief that ultimate reality is an impersonal, theistic principle. The Absolute world and individual self are changeless, and the world is illusory, neither real nor unreal. Appearance is considered practically real but ultimately unreal, since all knowledge points to an object beyond itself.

(b) Chinese philosophy developed in four stages (Chan, 1967):

(1) The ancient period (until 221 BC), represented by the humanistic teachings of Confucianism and Taoism.

(2) The middle period (221 BC - AD 960), dominated by the teachings, transplanted from India, of the followers of Indian religious leader Buddha. They

developed a philosophy offering a synthesis between the two extremes of being and not being, distinguishing between the forms, sensations, ideas, and consciousness of reality.

(3) The modern period (960-1900) of Neo-Confucianism, stressing the interdependence between reason and providing some syntheses of 'many [experiences of reality] into one' and the vital force, which differentiates 'one [reality] into many.' Nothing can stand by itself and everything has its opposite in a universe bound together by social order.

(4) The contemporary period (twentieth century) is characterized by the influence of Western philosophy, especially of American pragmatism and Marxism.[17]

Confucianism and Taoism competing with each other, were the early definite schools of Chinese philosophy. Confucius (551-479 BC) represented moralism and humanism by advocating the doctrine of being true to one's own nature in harmony with the universe. Taoism was a revolt of the individual. Both philosophies interpreted 'Tao,' the way, differently. For Confucius the right way was an ideal of moral order to follow reason; for Taoism, 'tao' represented the totality of all things in the cosmic order, the principle of ultimate unity within that totality. The farther a person is removed from that totality the less happy he is. The individualism of Taoism opposed government intervention into affairs of individuals, thus implying political anarchy.[18]

(c) Probably one of the first philosophical speculations of antiquity was the ethical question asked about morality of human behavior. Credited with the introduction of ethical dualism, Zarathustra, interpreted the moral dilemma in terms of the struggle between good and evil, truth and falsehood, leading to the concept of the Hebrew's Satan and the Christian's devil (Taraporewala, 1950). The 13th century Inquisition, administered in the name of the proclaimed 'good' and the modern justification for censorship, may claim its origin in the ancient devotion to Ahura Mazda, the God of Light and the hatred of Angra Mainyu, the Bad Spirit.

### 5.3.2 CLASSICAL AGE: Laying the Foundations [600 BC - AD 400][19]

The beginning of the classical period is characterized by a freedom from direct religious restrictions. Philosophers concentrated primarily on the origins of the physical universe and its makeup, searching for the universal laws of uniformity.

A millennium of classical culture is a long period of building a cultural foundation that lasted for two thousand years. The Greek period is considered the beginning of intellectualism, characterized by the preeminence of reason. It marks the decline of the power of the priesthood and a preoccupation with death in Egypt, and departure from Indian philosophy's perception of the external world as illusion. With time, the Egyptian concept of spirit and India's search for inner truth blended in the Greek separation of religious myth from the reality of physical existence. Greeks introduced the idea of the freedom of individual, who could think for himself. They searched for the meaning of everything. And, most importantly, they interrelated all these aspects into a logical, orderly system.

(a) Sophists. The science began with Thales' defense of common sense and his insistence on the importance of the observation in the study of nature. His focus on the technique and method of thinking emphasized the importance of experimentation taking priority over the ideas deducted from it. The debate about the primacy of one approach over the other continues even today, and it is extended to contemporary philosophical disputes among some information and library scientists.

Pythagorean dualism distinguished between thinking and perception, the form and its appearance. Pythagoras' mathematical interpretations of relationships between various phenomena led to a priori mathematical reasoning, independent of empirical observations.

Heraclitus' law of change says that: "all things flow, nothing abides. Into the same river one cannot step twice." The relative stability of the universe is maintained by tension between the opposing forces of change and resistance to it. Similar tension is experienced today by librarians who must mediate between conflicting demands for stability and change in the management of library resources and services.

To Protagoras, everything was relative and knowledge was only of the perception of things, not of the things themselves. His statement that 'man is a measure of all things' implies that each man can have his own opinion. Consequently, there is always more than one view on any issue--a good argument for librarians' professional neutrality.

Socrates, Plato, and Aristotle, the most important philosophers of the classical period, made a critical impact on intellectual development in Western culture. Their philosophies also become cornerstones of the philosophy of librarianship.

(b) Socrates' method of learning through reasoning and his focus on definitions are implemented in the reference librarian's method of assisting the patron not by providing direct answer but rather through questioning technique, which leads the patron to proper resources.

(c) Plato's doctrine of ideal form, in which objects are tentative representations of unchanged ideas, is considered the true knowledge and becomes the credo of library idealists. On the other hand, in accordance with Plato's concepts of absolute values, the struggle for perfection and a paternalistic, authoritarian view of society were excusable if advocated in interest of society (Staveley, 1964).

(d) The Aristotelian scientific method of empirical accuracy, deduction, and investigation of specific things and situations formulated the bases for modern logic, physical and biological sciences, psychology, metaphysics, ethics, politics, literary arts, and information science.

Aristotle maintained that there are three elements in any change: a *terminus a quo* (e.g., a book or a librarian, or both); *a terminus ad quem* (e.g., the end of the process, the reader) and the process itself (e.g., communication). Overlooking the distinction between books and the librarians' role in communication processes is often a cause of confusion.

(e) Porphyry combined Aristotelian logic with Neo-Platonic philosophy and developed a classificatory scheme, known as 'Porphyry's Tree,' based on the arrangement of types from the most comprehensive to the most specific. Many of the library classificatory systems are based on this approach.

We have inherited from the classical period the concepts of metaphysics (understanding the universe by logical, a priori, investigation of the meanings describing reality); and of epistemology, analyzing the very problems of that understanding (the possibilities, origins, and limits of knowledge and the problems of methodologies used in this analysis).

### 5.3.3 AGE OF BELIEF: Medieval Speculations [AD 400-1400] [20]

Politically and economically, those were dark ages, marked by disease, hunger, and despair. Philosophically, it was a period of searching for the meaning of the human existence and return to the dominance of theology.

(a) The metaphysical tradition of the previous area was continued by Christian philosophers: Saint Augustine, who represented the platonic belief in ideas, and intuition; and Saint Thomas Aquinas who represented an Aristotelian philosophy of universals, and experimentation.

The philosophical contribution of the period is characterized by the changing focus of interest among philosophers. Saint Augustine considered knowledge as probability only. Roger Bacon shifted his attention from the 'why' to the 'how' of the explanation of reality, advocating deductive application of principles and experimental verification of results. His scientific mind anticipated the invention of locomotive, flying machines, and circumnavigation of the globe.

Thomas Aquinas, on the other hand, defined philosophy as a knowledge of ultimate things based on reason, and science as a knowledge of facts based on general principles. His philosophy was derived from religious belief in the immortality of the soul, stressing the importance of the individual's self-realization. This view is reflected in the library's educational responsibility for providing environment for patron's self-education (Staveley, 1964).

William of Ockham was a conceptualist who believed that the universals are the products of mind, known intuitively. Considered by science as mere propositions, these concepts ought to be reduced to the necessary minimum (Ockham's Razor).

In metaphysics, the predominant theme was the differentiation between the essence (the 'what-ness') and the existence (the 'that-ness) of reality. In epistemology a clear distinction emerged between (a) the Realists, focusing on platonic form (Augustine) or Aristotelian universality perceived as function of mind (Aquinas); (b) the Nominalists, limiting the meaning of 'universality' to the discourse about reality (Ockham), and (c) the Conceptualists, interrelating the above two positions, by limiting the concept of 'universal' to an abstract or ideal concept, shared by all members of the same class of particulars (Abelard).

(b) Mediaeval Judaism produced no formal philosophy, but engaged in philosophical reflections as a function of religion. These reflections represent an ethical monotheism in a concept of a universal God, represented in anthropomorphic and poetic description of his personality. This, in turn, introduced the concept of a philosophy of history as an unfolding drama of creation of man and his search for purpose in life. An applied philosophy was later developed in the form of literature. For example, the books of Proverbs (ca. the fourth century) considered wisdom the attribute of God, transcending human experience. This view was close to Plato's theory of Ideas, and in the book of Job (ca. 400 BC) to the definition of happiness as a reward for goodness.[21]

(c) Although Arabic philosophy did not develop its own unique system of ultimate reality or theory of knowledge, the Arabic focus on logic and methodology, accompanied by an interest in science, mathematics, and medicine, contributed significantly to empirical knowledge.

Two philosophers made important contributions to the understanding of the structure of reality. (1) Avicenna (980-1037) made a distinction between essence and existence, which corresponds to the distinction between God and the world, with the real world gradually emanating from its essence through many intermediate beings. (2) Averroes (1126-1198), distinguished between religion and philosophy, claiming in his concept of 'twofold truth' that a proposition may be true theologically but false philosophically or vice versa. He also maintained that "all thinking, although it occurs individually, becomes in a real sense universal, and that this universal aspect is more intrinsic to human cognition than is the fact that it is the product of such-and-such an individual or individuals."[22]

### 5.3.4 AGE OF ADVENTURE: Philosophy of the Renaissance [1400-1500][23]

The changes brought about by geographical discoveries clashed with the stability of classical tradition. This was reflected in several contradicting schools of thoughts: humanism, Platonism, Aristotelianism, skepticism and natural philosophy. Santillana summarized the philosophy of the period as a transition between antiquity and modern history:

> The philosophical effort is a helter-skelter advance . . . in the obstinate effort to transform old systems apace and enrich them with new elements without losing the essential ideas they carry from the past . . . [it is] not a systematic philosophy; |but a| critical revision and creative thought embodied in powerful personalities who work out a momentary cosmos of their own.[24]

Two centuries of changes shook the foundations of the medieval world. The pragmatism of Leonardo da Vinci, the humanism of Erasmus, Machiavelli's realpolitik, Luther's moral revisionism, and Copernican heliocentrism marked the new chapter in the history of Western philosophy.

### 5.3.5 AGE OF REASON: Modern Philosophy [Seventeenth century][25]

This was a formative period of modern philosophy. Characterized by the emergence of physical sciences and a decline of the medieval concept of knowledge, it was based on Aristotelian methodology. It marks the beginning of independence from classical authority, although the authors of this period continued to refer to Greek and Roman cultural inheritance. At first, the use of Greek or Latin reflected different modes of abstract thoughts. Descartes was the first philosopher whose style was simple and free of scholastic technicalities, making the French language and its philosophy a dominant force in Europe.

In this period the search for positive knowledge and for natural methods of explaining phenomena began in earnest. For many centuries Aristotelian logic based on the syllogism was a model for rational thinking. It provided the method for the scholastic philosophy's preoccupation with concepts such as essence, substance, and distinctions between essential and accidental properties. Yet the objectives of science differed from those of philosophy by focusing on the mathematical precision of natural laws and on a rational explanation of natural phenomena. Not until Newton was a distinction made between 'philosophy' and 'natural philosophy,' i.e., 'natural science.' Until then, both metaphysics and physics were still parts of the same philosophical inquiry.

Philosophers of the seventeenth century were also scientists. A distinction is usually made between the experimental part of their science, now obsolete, and their philosophical insights into theories of science. This was a period of scientific discoveries which led to a conflict between science and religion, culminating in church persecutions of scientists like Galileo.

Descartes, Spinoza, and Leibniz used deductive and a priori methodology in their description of ultimate reality, and in the definitions of the limits of human knowledge.

Descartes made metaphysics a scientific, rigorous, and intellectual discipline. Spinoza introduced an ideal system of metaphysical interpretation of scientific inquiries, and Leibniz reaffirmed that metaphysical truth is an a priori and logically necessary concept. In epistemology, the same three philosophers addressed perception as intellectual rather than sensuous apprehension (Descartes and Spinoza), making up an inner state of metaphysical individuals, the monads (Leibniz).

"Descartes, Leibniz and Spinoza are read . . . for the richness and variety of their analyses of the concepts upon which our thought depends -- for their analysis of knowledge and certainty, appearance and reality, existence and identity, freedom and necessity, mind and matter, deduction and experiment." [26]

### 5.3.6 AGE OF ENLIGHTENMENT: Philosophy of Natural Sciences: [Eighteenth century][27]

The goal of philosophy in this period was to convert it into natural science by advocating the use of empirical observations in discovering facts. Philosophy becomes a kind of scientific psychological physiology or behaviorism, analyzing everything into ultimate atomic constituents. The theory of mind was mechanistic. Nature was compared to an organism or a watch, and social life to a factory workshop. The senses were considered the sole source of knowledge. However, since necessity and identity are relations that cannot be discovered by observation or introspection, they cannot be real relations. Knowledge is of two kinds. One rests on formal criteria and can give no information about the world. The other, if it can provide such information, is only probable, never infallible. Knowledge can have only logical or mathematical certainty. This distinction corresponds to the distinction between 'synthetic' and 'analytical,' between a posteriori and a priori knowledge.

The process of making philosophy a natural science was questioned by Kant's insistence, in Berlin's words, that

> the task of philosophy is -- and has always been -- not to seek answers to empirical questions of facts . . . nor can it be a purely deductive discipline . . . such as logic or mathematics . . . neither . . . empirical investigations . . . nor answered by deduction from self-evident or a priori axioms . . . by the schoolmen and rationalists...this approach focused on analyzing the general and pervasive concepts and categories. [28]

Kant distinguished between judgment and sources of data, beliefs, and attitudes, and logical principles applying to factual and speculative arguments. The question is 'What is the correct sort of evidence needed to prove the truth of such and such proposition?' and not 'How do I learn about the truth of such and such proposition?' The former is a procedural question about establishment of the truth. The latter is a psychological inference. It is confusing to ask, 'How can we know the proposition X?'-- which is neither 'What is the right evidence for it?' nor "Whence do we acquire the knowledge of X?' The questions relate to a distinction between the source of knowledge that is empirical, and the frames of references or systems of relations.

Eighteenth-century philosophers, impressed by the progress of science, felt that the same progress can be made in philosophy. They believed that different views, once stripped of irrational elements, will fall into a single, harmonious knowledge. Opposition to this optimism began in the middle of the century, arguing that man is not a machine and society not an inanimate or zoological universe.

### 5.3.7 AGE OF IDEOLOGY: Ideological and Cultural Reconstruction [Nineteenth century][29]

A period between Kant and Mach is marked by the reappearance of metaphysics in the form of Hegel's idealism , Spencer's evolutionary naturalism, and Marx's dialectical materialism -- all focusing on man and his historical development.

Emphasis was on the relationship between a mode of thought, its object, the relevant thinking about reality, and the reality itself. The thinking subject establishes the criteria for objectivity by presupposing the existence of the principles of conceptual organization. It is based on 'historical consciousness' developed in response to changing conditions. Here philosophy is not considered an extension of science, but a critique and justification of reason itself.

Some romanticists were also revolting against the previous century's philosophical glorification of reason. Objectivity becomes an intersubjective norm of common standards of judgment and criticism. This period also represents a reaction to the progressive breakdown of the medieval Christian syntheses, by providing humanistic and secular bases for an ideological and cultural reconstruction through grandiose philosophies of historical synthesis.

Toward the end of the century a pragmatic viewpoint was formulated by Peirce. To him, reality was a constantly changing and unpredictable concept, anticipated metaphysically, described scientifically, and defined by the consensus. He rejected intuitive knowledge by insisting that everything be determined by its practical utility.

### 5.3.8 AGE ON ANALYSIS: Entering Uncharted Philosophical Territory [Twentieth century][30]

This is a very active period of predominantly analytic, pragmatic, and linguistic Anglo-American philosophy and more technical philosophies of logical positivism, realism, and analytic philosophy. The twentieth century started with an attack on Hegel's Absolute Idea. Hegel replaced Aristotelian static logic with more dynamic dialectical logic, and his historical approach influenced Darwinian biology. On the other hand, the revolt against Hegel, generated for the most part by his initial followers, was twofold: the marxian revolt moved from dialectic idealism to dialectical materialism, while Dewey, Russell, and

Moore shifted from a historical, political, and ethical approach to one that was logical and epistemological. Dewey and Santayana rejected Hegelian dialectics but retained his synoptic, total view of man and universe, while logical positivists rejected the Hegelian world view totally, by excluding cultural, political, and social issues from their analyses. This period is characterized by the distinction drawn between a philosophy of hedgehogs, aiming at the understanding of one big thing, and a philosophy of foxes, interested in many little things -- or sometimes, in just one little idea.[31]

Overall, twentieth-century philosophy is divided into three viewpoints: (1) evolutionistic and idealistic notions of Bergson's time and instinct, Whitehead's life, process, and organism, Croce's history and art, and Husserl's existential insight; (2) the pragmatism of Peirce, William James, and Dewey, which combined metaphysical totality with scientific and logical methods; (3) the analytic philosophy of the strongly anti-metaphysical, logical positivism of Wittgenstein and Carnap, the ordinary language of Moore and Wittgenstein, and the mathematical and logical philosophy of Russell.

Toward the end of the twentieth century the cultural issues were revisited. The philosophy of reason, challenged by new irrationalism and anti-intellectualism, is bringing back the metaphysical approach and Kantian critical self-consciousness. The primary metaphysical concern was always coherence and an other-than-scientific interpretation of reality.

Logical positivism rejected the metaphysical approach for its lack of empirical proof, rather than for the problems it raised. It focused on the way reality was described by science, rather than what it meant metaphysically. In epistemology Russell developed an important distinction between knowledge by acquaintance and by description. The ordinary-language philosophy of Wittgenstein and Ryle called for a restatement of metaphysical questions in terms of their linguistic structure. Husserl's phenomenology identified subjectivity with immediate experience, and the existentionalists Kierkegaard, Sartre, and others abolished a distinction between the external and internal worlds, claiming that all existence is a state of mind.

The significant syntheses provided by philosophical analysis are difficult to define. It offers a new outlook on old metaphysical problems by analyzing the concepts in metaphysics, and by incorporating the insight of past metaphysical speculations with new developments in the philosophy of science.[32]

## 5.4 What is Reality?

The question about reality, discussed in the previous section, is not yet -- and probably will never be -- fully answered, although a number of hypotheses about it were formulated. Science provides an experimental validation of their assumptions, mathematics and logic examine the propositions for contradictions, and philosophy clarifies their meaning.

Schematically, we can summarize academic discussions by identifying three approaches to the definition of reality.

(1) The objective assessment of reality in the natural sciences provides a physical, mechanistic structure and abstract descriptions of concrete experiences.

(2) In the subjective, psycho-sociological description of the reality of living organisms, biological sciences focus on the study of functions of organisms in environment. They provide a prescription for reality based on behavior and its consequences.

(3) Logical, philosophical definitions of the meaning of reality propose relationships between the structure and the functions within the 'known,' verified, experienced reality and less-known opinions about it. It is a rational reconstruction of scientific descriptions, scrutinized by critical evaluation of its values and purposes.

Natural sciences describe external reality as biological sciences describe inner reality, while philosophy defines their meaning.

LIS can similarly describe its structure, functions, and forms in terms of the above three dimensions. The metalibrary intention is to draw attention to the unique phenomena in librarianship by identifying, scrutinizing, and clarifying assumptions made about its subject matter.

## 5.5 Major World Views

### 5.5.1 Introduction

The concept of 'world views' refers here to distinct ways of communicating ideas about reality. Reality relates to the totality of our experiences, the actual and real as well as the subjective appearance of real things in a form of ideas or events. Russell maintained that the issue of appearance versus reality becomes "one of the distinctions that causes the most trouble in philosophy."[33] The controversy of whether our knowledge reflects true reality or its mere appearance is exemplified by the extreme view of skeptics doubting anything, or dogmatists "whose belief exceeds [their] cognitive ground for belief."[34]

Pepper proposes a third approach, a middle-of-the-road world hypothesis which "signifies that these objects . . . are not final products of knowledge and yet that they do contain knowledge", [35] and should be treated as unique viewpoints.

The concept of reality and its meaning are essential in the philosophy of librarianship, since they define the nature of knowledge, which is being communicated in library transactions. World hypotheses become crucial in the model of metalibrarianship developed later in this book.

By way of synthesis, I have arbitrarily reduced various world viewpoints to three distinct groups of hypotheses: empirical, rational, and cultural. I believe that each of these groups of views has a uniquely different interpretation of knowledge, whether considered as an appearance or as an actual description of reality.

### 5.5.2 Empirical viewpoint: Philosophy of Objective Reality

The empirical approach focuses on the objective, physical existence of the universe. It sees reality as the totality of objects and events in space and time. And it is studied behaviorally, by reducing changes in the objects and events to causal laws and by focusing on particulars and their properties, all subject to external influences.

Phenomena are interpreted mechanistically, as parts of systems moved by resident forces. This approach explains the present and the future in terms of the past; in its extreme case, it considers changes as merely consequential, mechanical, and aimless activities governed by mechanical principles. Perception of existence is based on sense perception, a physical experience provided by physical receptors. The source of knowledge is experience, which often is pragmatic, evaluated in terms of the practical consequences of ideas.

### 5.5.3 Rational Viewpoint: Philosophy of Logical Reality of Ideas

Rationalism considers the universals as conceptual ideas developed in our minds. It is represented by the platonic school of realism which maintains that reality is ultimately independent of any knowledge of its existence.

The focus here is on the realm of essence, the universals that exist before the things (*ante res*). It is a teleological theory of purpose, ends, goals, and values, explaining the past and the present in terms of the anticipated future. Epistemologically, it adds the subjective, intuitional, and instinctive perception of phenomena to objective, factual experience and its logical explanation. Metaphysically, it saw reality in terms of reasons for, and ends of, actions, explained by reference to some purpose. Ethically, it stresses value over obligations.

The mode of being is the essence, the necessary internal relations or functions which are sometimes identified with the substance. The essence determines the nature of things (Leibniz); it is the primary principle of the Kantian thing-in-itself, that is, something that can be 'thought' but cannot be known, making 'being' what it is. To Peirce, essence is the 'intelligible element of the possibility of being.'

In epistemology this view expresses 'the universal possibility of a thing.' Santayana sees it as a hybrid of intuited data and scholastic essence. In logic  it is the definition of a thing, metaphysically considered independent of the thing's existence (Runes, 1981).

The theory of knowledge is idealistic, interpreting reality in terms of ideas or thoughts as essential components of knowledge.

The knowledge itself is deductive, derived from reason rather than from experience.

### 5.5.4 Cultural Viewpoint: Subjective Philosophy of an Individual and his Society

This viewpoint is based on a socio-cultural hypothesis, considering universals as cultural expressions of reality, in which each universal is viewed in relation to the whole.

The mode of being is defined as existence in relation to interaction with other things, affecting them or being affected by them, as contrasted with the mere possibility of existence.

Focus is on the consciousness, formed physiologically by the nervous system and culturally by environment.

The theory of knowledge is phenomenological. It is limited to conscious experiences of sense-perceptions and to mental introspection. It affirms the reality of things-in-themselves but denies their knowability. Various interpretations of phenomenological philosophy cover empirical, existential, and rational relationships between things and events.

The above classification of world hypotheses is adapted in my model as a threefold interpretation of environment that affects relationships among primary components of metalibrarianship.

## NOTES

1. Garvey, W. D. (1979). *Communication: The Essence of Science. Facilitating Information Exchange Among Librarians, Scientists, Engineers and Students*. Oxford, New York: Pergamon Press, p. 15.

2. Lakoff, G. (1997). *Women, Fire, and Dangerous Things; What Categories Reveal about the Mind*. Chicago: The University of Chicago Press, p. 157.

3. Kemp, D. A. (1976). *The Nature of Knowledge; An Introduction for Librarians*. London: Clive Bingley, p. 11.

4. Russell, B. (1945). *A History of Western Philosophy*. New York: Simon and Schuster, p. xiii.

5. Ibid., p. 67.

6. Berlin, Isaiah (1956). *The Age of Enlightenment*. New York, New American Library, p. 11.

7. Ibid., p. 12.

8. Philosophical views summarized here are abstracted from the standard reference publications listed in the bibliography and from cited essays. The selections of the representative philosophers and their views are arbitrary, used only as illustrations for the theme of this book.

9. See also Kennick, W. E. (1967). "Appearance and Reality." *The Encyclopedia of Philosophy*, 1967 (P. Edwards, ed.) 1, 135-138.

10. Saksena, S. K., (1950) "The Story of Indian Philosophy." In V. Ferm (ed.), *A History of Philosophical Systems.* New York: The Philosophical Library, p. 3.

11. Traue, J. E. (September, 1990). "Five Thousand Years of the Information Society." *New Zealand Libraries*, 46(6), p. 18.

12. Fackenheim, E. L. (1950). "Mediaeval Jewish Philosophy." In *A History of Philosophical Systems*, op. cit., p. 171.

13. The discussion of Indian philosophy is based primarily on the essay by S .K. Saksena (1950), op. cit., and N. Smart (1967), "Indian Philosophy." In: *The Encyclopedia of Philosophy*, 1967, op. cit., vol. 4, pp. 155-169.

14. Saksena (1950), op. cit, p. 7.

15. Ibid., p. 8 .

16. Ibid., p. 12.

17. The primary source for this section is Crell, H. G. (1950) "Chinese Philosophy (Confucianism, Moism, Taoism, Legalism)". In V. Ferm (ed.), *A History of Philosophical Systems*. New York: The Philosophical Library, pp. 44-56.

18. Ibid.

19. Primary sources for this section were various essays in the *Encyclopedia of Philosophy*, 1967, op. cit., in *A History of Philosophical Systems*, 1950, op. cit., and in standard and philosophical dictionaries.

20. The primary source for this section and its title are from Fremantle (ed.), *The Age of Belief*, 1954.

21. Cohon, S. S. (1950). "Ancient Jewish Philosophy." In Vergilius Ferm (ed.), *A History of Philosophical Systems*. New York: The Philosophical Library, pp. 57-69.

22. Rahman, F. (1967). "Islamic Philosophy." In *The Encyclopedia of Philosophy*, (P. Edwards, ed.) vol. 4, p.223.

23. The title of this section and its main references are from Giorgio de Santillana (ed.) (1956), *The Age of* Adven*ture*. New York: The New American Library, pp. 9-10.

24. Ibid., pp. 9-10.

25. The title of this section and major references were from S. Hampshire (ed.) (1956), *The Age of Reason*, New York: New American Library.

26. Ibid., p. 18.

27. The title of this section and its main references are from Isaiah Berlin (ed.) *The Age of Enlightenment*, 1956. New York, New American Library.

28. Ibid., p. 24.

29. The title of this section and its content are based on *The Age of Ideology*, H.D.Aiken (ed.), 1956.

30. *The Age of Analysis*, M. White (ed.), 1955, provided the title and the source material for this section.

31. Berlin, I. (1978). "The Hedgehog and the Fox." In I. Berlin, *Russian Thinkers*. New York: Viking Press, p.18.

32. The scope of the philosophical analysis is well illustrated by Feigl's and Sellars' compilation (1949) of relevant essays. "The conception of philosophical analysis underlying our selections springs from two major traditions in recent thought," Feigl and Sellars explained, "the Cambridge movement deriving from Moore and Russell, and the Logical Positivism of the Vienna Circle (Wittgenstein, Schlick, Carnap) with the Scientific Empiricism of the Berlin group (led by Reichenbach). These, with related developments in America stemming from realism and Pragmatism, and the relatively independent contributions of Polish logicians, have increasingly merged to create an approach to philosophical problems, which we frankly consider a decisive turn in the history of philosophy" (Feigl and Sellars, 1949, p. vi).

33. Russell, B. (1912). *Problems of Philosophy*. London: Oxford University Press. (Quoted by W.E.Kennick, *Encyclopedia of Philosophy*, 1967, vol. 1, p. 135).

34. Pepper, S. C. (1957). *World Hypotheses*; *A Study in Evidence*. Berkeley: University of California Press, p. 11.

35. Ibid., p. 3.

# CHAPTER 6:
# WHAT IS PHILOSOPHY OF LIBRARIANSHIP?

## 6.1 Environment for the Philosophy of Librarianship

Writings in the philosophy of librarianship are very recent, in part because the origins of the discipline itself are not well understood. As already pointed out in an earlier chapter, the anthropological discoveries of library artifacts are accidental. We know only what the discovered artifacts tell us about ways certain library activities were performed, but not why they were performed in a given fashion. The initial scarcity of a philosophical approach to librarianship was explained partly by a lack of interest (Butler), and partly by a very pragmatic approach to library issues (Joeckel).

Even today, there are very few direct philosophical essays written in librarianship. Most contributions are in the form of discussions of specific issues, related to the specific aspects of librarianship, or as a plea for the development of a broad philosophy.

Hence, a philosophy of librarianship exists, but is not well expressed (Lane, 1935). It cannot exist in a vacuum; its goals are constantly challenged since librarianship is a journey not a destination; no one is a librarian, everybody is becoming one (Mumford, 1966). The philosophy that exists reflects a variety of environments, different human values, and their interpretations by individual librarians (Reddy, 1970). It includes topics such as historical influences, social roles, citizenship responsibilities, and psychology of readers: it is conceived as a map of knowledge (Wheeler, 1946). Among the variety of general philosophical statements, each is often presented as a unique viewpoint, while most of them together may constitute the bases for a philosophy of librarianship. It is up to each librarian to select the approach closest to his own philosophical outlook (Marco, 1966). In summary, there is a need for rethinking library principles.

In this section I ask the question: What are the epistemological nature, metaphysical meaning, and ethical value of librarianship? And I review library literature in search of philosophical answers to them.

### 6.1.1 Scope of the Philosophy of Librarianship

In 1931 Borden argued for a philosophy as a necessary part of research in librarianship, which would study the relationships between different aspects of the discipline. "The mere doing of the research may yield something in the way of training and technique but the conclusions will sound hollow without a philosophy to back them up." [1]

Danton's plea for philosophy of librarianship, made in 1934 and often cited, was the first call for a description of aims, functions, and meaning of library services. Put together, these descriptions would provide general concepts of librarianship, serving as the bases for its philosophy. This could be accomplished through series of studies on individual aspects of the discipline. He also hoped, that a consensus on the world view of librarianship would lead to the development of the field's own metaphysics in spite of the fact that librarianship was viewed in the context of social philosophy at the time (Danton, 1934).

Among other early writers, Ranganathan adopted a philosophical approach that was limited to the service aspect of librarianship only, while Butler overlooked the distinction between library science (librarianship) and its philosophy. Danton's second essay addressed the philosophy of the university library and its dependence on the parent institution. He recommended a sociological approach, connecting library philosophy with its function--that is, to be practical, comprehensive, and responsive to patrons' needs (Danton, 1941). Richardson visualized, a philosophy of librarianship that would be based on librarianship as a repository of human knowledge, while Coney expected "a classic statement of the value of library to the society." [2]

### 6.1.2 The Need for a Philosophical Approach

Although many librarians are aware of the need for a philosophy of librarianship, there is little agreement as to what it ought to be. The National Commission on Library and Information Science (1974) stated that such philosophy should be based on a common sense of direction and purpose in national service. Winter (1988) called for a metascience dealing with the organization of knowledge itself, Clayton (1940) expected a philosophy of librarianship to help people realize their abilities, and L. Wilson (1936) felt that librarianship needs an institutional philosophy of education which would serve individuals' needs as well as those of society. Butler (1945) expressed his optimism by hoping that the vagueness of philosophical contributions will be slowly replaced by a need to explain the role of the book and the importance of the library's loyalty to truth, justice, and beauty.

Many writers referred to a need for a philosophy of librarianship as a means for improving the professional status of librarians (Berthold, 1933). Such a philosophy could clarify its uncertain purpose (Wheeler, 1946), validating the library as a discipline with its own scientific method (Danton, 1941), ethical motives (Bliss, 1935), and an intellectual role in society.

And, finally, some writers have seen a philosophy of librarianship as a way of providing analyses of subjective judgments of library functions (Carnovsky & McDiarmid, 1934) and of justifying library dedication to facts (Borden, 1931). Others would limit a philosophy to explaining the meaning of the intellectual contributions of innovators such as Dewey, Bowker, or Cutter (Wilson, 1938).

### 6.1.3 The Value of Philosophy to Librarianship

The application of philosophy to librarianship will provide clearer understanding of its functions and limitations. The result would be a more logical distribution of functions between professional, technical, and clerical staff; improved opportunities for the use of scientific methodology; and heightened professional unity (Butler, 1951).

Danton (1934) listed a number of advantages for a philosophy of librarianship. It will define the role of library in society; validate librarianship as a discipline; add meaning to library practice; clarify knowledge of purpose, thus adding precision to actions; and provide distinctions within librarianship between the varying functions and duties performed by different types of libraries.

Foskett (1973) expanded the advantages by considering the contributions of classifications to the theory of librarianship. He pointed out that librarianship depends on technology, the primary motive of which is not to provide work for machine but to meet human needs. Man needs information to cope with his environment, not only by understanding it better but also by changing it; he acquires knowledge to form rational ideas organized in an ordered and consistent structural system of concepts.

A synthesis of theories culled from other disciplines would provide a major contribution to the theoretical bases of the profession (Shaughnessy, 1976) and would validate practical philosophy in terms of its justification for library operations and its code of ethics (Houle, 1946).

The major purposes of the philosophy of librarianship, according to Mukherjee, are: (a) to serve as a comprehensive and specialized tool for information and knowledge, (b) to express its social obligations for social services, and (c) to provide a base for research and scholarship (Mukherjee, 1966).

## 6.2 Major Components in the Definitions of the Philosophy of Librarianship

### 6.2.1 Introduction

The writers in favor of articulating a philosophy of librarianship were uneasy and unclear as to what it should be. To some it was not so much a philosophy *of* librarianship, as a philosophical approach *to* librarianship, providing ruling principles and statements of aims (Irwin, 1949). To others its focus should not be on the library but on books and readers (R. A. Miller, 1936), by providing a practical -- not metaphysical -- formulation of beliefs and aims. And finally, for some writers, a philosophical approach should make up for a lack of common denominators (L. R. Wilson, 1938).

A philosophy of librarianship slowly emerges with the maturity of the discipline. It becomes critical analyses of the mission of librarianship (the 'why' of what it is), of its application (how it is being implemented), and of its meaning (the nature of relationships between purposes and methods of performance).
It focuses on interrelationships between society's needs and institutional resources and on its role in scholarship. Scholar-

ship produces books; librarianship provides books as a stimulus for scholarship and learning.

"Librarianship is the management of human knowledge, the most interdisciplinary of all the disciplines -- and because it is concerned with the philosophy of knowledge it is potentially the most deeply philosophical of all the professions" and hence it should address the philosophy of the philosophy of knowledge. [3]

Philosophy precedes science and offers meaning and direction to research. Its major expression in librarianship is the statement of library purpose. The search for a philosophy may begin in the study of library history for past expressions of the beliefs, aims, functions, and objectives that described operations of the library. But it must be constantly reviewed to keep up with the changing society, which requires redefinition of library objectives in terms of the changing environment. We cannot refer to science and factual knowledge for assistance in this matter.

Philosophy is shaped by society, its group interests, and the conflicts between them. It is relativistic in its response to the impact of different cultures. Each culture develops its own theory of librarianship, with its own peculiar philosophy (Rogers, 1984). Jewett expected it to support democracy, but that role is interpreted differently by different writers. For Butler, what is important is the virtue of good citizenship (e.g., he condones some censorship for the good of the society), but for Broadfield the primary function is the protection of freedom of thought (he allows no censorship under any circumstances). Danton takes the middle-of-the road approach; to him, librarianship is like art, requiring intellectual formulation of beliefs, principles, and concepts which are functionally useful (Danton, 1934).

On the other hand, some western writers, especially during the Second World War period, argued strongly against the neutral library viewpoint, believing that the philosophy of librarianship should focus exclusively on democratic ideals, serving as a consultative agent of democracy (Peirce, 1951).

Definitions of philosophy of librarianship ought to follow Plato's requirement for understanding the distinction between true reality and its appearance, to use the dialectical method in the critical review of other viewpoints, and to be able to bear up under the scrutiny of cross-examination. The prerequisites for philosophical analysis include the understanding of the nature of phenomena studied and the ideal purposes aimed at. The dialectical methodology used is a composite of many philosophical interpretations. They include, among others, Bergson's intuition, Wittgenstein's call for uncovering nonsense, Hegelian phenomenological description, Hume's experimental inquiry, and Spinoza's geometric, logical approach.

In general, library philosophy is descriptive, in the sense of providing rational explanation of other theories. It is also prescriptive by suggesting what ought to be the course of action under given conditions. In neither case, however, it imposes its specific interpretation on other viewpoints. Hence, the approach often takes a form of a 'rational reconstruction', one "which is not so much prescribing as drawing attention to a difference" between philosophical and other interpretations of reality, and recommended actions.[4]

And so, opinions on what the philosophy of librarianship ought to be vary widely. To some, its focus is on ends rather than means (Burke, 1947), but to others it is "a critical discussion of critical discussions": an exercise in curiosity rather than love of wisdom.[5]

In the context of this essay, philosophy of librarianship is defined as a systematic attempt to understand the basic concepts related to library and information sciences, by studying the essence, nature, and value of discourses in librarianship.

As shown in the diagram below, library philosophical dialogues can be divided into two major approaches, one addressing physical aspects of library operations, the other its metaphysical nature. The former group focuses primarily on library tools, and the latter stresses the meaning of communicated ideas. Information science is a pragmatic study of information interpreted as processed data; librarianship concentrates on contents [illegible] information records.

PHILOSOPHICAL DIALOGUE IN LIBRARIANSHIP
Addresses:

| | |
|---|---|
| Physics of Library Operations | Metaphysics of Librarianship |
| Tools (e.g., Measurements) | Functions (e.g., Interpretation) |
| Means (Technological) | Ends (Conceptual) |

Philosophy
Focuses on:

| | |
|---|---|
| Controlled manipulation of data by Information Science | Access to recorded ideas provided by Librarianship |
| Pragmatic | Rational |
| Information as processed data | ideas about reality |

Communicated
in
Philosophical Dialogue

Fig..6-1: Philosophical dialogue in librarianship

### 6.2.2 Evolving Objectives of the Library Philosophy [6]

Library objectives closely reflect societal objectives of the period. The pattern began in the pre-modern period with the focus on book content, augmented by attempts to enlarge the scope of library influence into an integrative role, as a cultural unit within the society as a whole.

Library involvement in the affairs of its community began in the period of Enlightenment with emphases on the value of reading for its own sake. It emphasized the humanistic notion of individual citizens' self-improvement which would in turn strengthen the general will of the society.

The continuous focus on reading as a cure for social maladies was based on a belief that all social problems were caused by violation of the laws of nature. The improvements in library technology reflected the philosophy of the Industrial Revolution based on the faith in science and technology.

Contemporary preoccupation with the multigroup interest in democratic systems explains the relativism of both political and library philosophy. It calls for an involvement in the affairs of society to minimize ensuing conflicts between group interests.

Several specific philosophical axioms applicable to librarianship were identified in the past. These included tolerance and dedication to service (Foss, 1909), striving for esthetic and ethical environment provided by books and stimulated by the 'love' of them (Bostwick, 1907), and selection based on patrons' needs. The librarian "must be informed not merely as to the books, but as to the reader. He must understand him and what actuates him.".[7]

It is a mistake "to forget that thinking comes before doing, reflection before action, looking before leaping, knowledge before business . . . [what is needed is] more theory, more philosophy, in short more thinking."[8]

Knowledge of books should be reflected in reading great literature (Sayers, 1950) and expressed in the power of a good book (Haines, 1950). It should give priority to servicing individual patrons (Broadfield, 1949), should maintain neutrality (McColvin, 1950), and protect intellectual rights and freedom of the library client (ALA, 1948).

There is no clear consensus on the overall approach to library philosophy. Wright wanted it to be metaphysical. Heilprin saw it as an objective approach with objectivity viewed as a method in processing subjective viewpoints. The philosophy should stress completeness (Carter, 1948), or an individual-centered whole system of relations, and should provide a rational explanation of reasons for certain occurrences. It should also include a bookman's 'passion for books'(Powell, 1954).

Many writers emphasized service function of librarianship (Asheim, 1968), based on the principle of 'knowing your community' (Downs, 1969), while others emphasized the importance of production, care, and use of records of knowledge (Meyer, 1925).

Predek wanted the philosophy of librarianship to focus on issues related to education, culture, nation, citizenship, Christianity, and democracy as fundamental ideals (Predeek, 1939).

Lekai advocated a philosophy of a library generalist, best prepared "to show the underlying relationship between cause and effect in man's progress toward understanding the meaning of things that lies beyond the realization of their variety." [9]

In my own writings, I stressed a logical and analytical approach distinguishing between technical, administrative, and planning aspects of librarianship, and focusing on the whole relationships between the generic book and its content transfer to the reader.

### 6.2.3 Epistemological, Ethical, and Metaphysical Questions

Selected answers to the three philosophical questions about librarianship posed at the beginning of this chapter illustrate a variety of different perception of the role of philosophy in defining librarianship.

(1) Epistemological questions concerning the nature of the discipline were answered by visualizing the philosophy of librarianship as:

(a) A situational theory in methodology, with unifying roles, goals, and decision-making processes, or focused on subject matter based on an organized unity and in harmony with library practice (Dimock, 1939), expressed by functional integration theory of organization.

(b) An expanded research into library's 'backgrounds' of history, bibliography, and relations to society, based on validated data and reasonable conclusions (McMullen, 1957).

(c) A communication system in general (Bergen, 1967, Orr, 1977); and specifically, as an interpersonal communication and knowledge system (McGarry, 1975).

(d) Both library science and practice considered as gestalt-oriented, applied epistemology. "Each library contains and integrates into some whole gestalt, 'some universe of knowledge'; and each such gestalt is internally differentiated into treatises and books and pamphlets."[10]

(2) Ethical questions relating to the library environment addressed several expectations:

(a) To develop a sociological, relevant theory using scientific methods (Crawford, 1986), to define its social role in terms of overall democratic, educational, and social functions (Borden, 1931), to provide a meaning for library work by identifying it with a professional *Weltanschauung* (i.e., a philosophy of life) and theoretical base, and to formulate policies reflecting social conditions and needs (Berthold, 1933).

(b) To concentrate on social advocacy by providing services in outreach areas for disabled persons and to speak on behalf of intellectual freedom (Reith, 1984). "Librarian's purpose . . . is basically to do everything possible to encourage a free flow of information and recreation and . . . enlightenment to . . . library users."[11] The freedoms defended by librarians include freedom of thoughts (Broadfield, 1949 ) and the freedom to read (Carnovsky, 1950). "Without intellectual freedom a librarian is only a bookkeeper, a storer, a book-handler."[12]

(c) To accept ethical responsibility for providing qualitative support to community's goals of improving its material and cultural values (Haugh, 1953). The library is at war with 'poverty,' and the librarian is a 'missionary of value of books and libraries' (Gardner, 1964).

(d) As a philosophy of action, based on the 'will to act,' librarianship should focus on planning and on fighting for financial needs. However, the emphasis should not only be on form but also on substance (Orman, 1935, 1940), by contributing to the development of professional consciousness and appreciation of education.[13]

(3) Metaphysical questions lead to the speculations about essence of philosophy of librarianship.

(a) The role of the library is expressed by applied social philosophy explaining its aims, functions, and reasons for existence (Lane, 1935).

(b) As a post-factum philosophy, it should stress relations of unity among similar facts (Borden, 1931), based on a theoretical model of utility (Burr, 1975), between service, education, and mediation (Nitecki, 1964), and by providing symbioses of individual and institution in an atmosphere of tolerance and perfect impartiality.[14]

(c) "Librarianship, library science, documentation, bibliography, and information science in the narrow sense . . . , have in common a focus on the written record and the physical documents,"[15] but in a metaphysical sense, librarianship is a metascience, not about nature of things, but about ideas about the nature of things (Kaplan, 1964). It is an art and science of reducing to order various records of words and ideas, organizing and manipulating them for definite purposes in terms of proximate and ultimate ends (Temple, 1949). To Gore (1970), a philosophy of librarianship should be based on skepticism, the approach opposed by Jackson.

(d) Library purposes are seen as tools for providing information and knowledge, addressing an issue of organizational efficiency, and as a social science. The library is responsible for educating its patrons through reading. The two often-confused purposes are equally important although often "the librarian wants to be a specialist, dealing with specialists, and finds himself a nonspecialist, dealing with general readers." [16]

(e) Philosophy should search for the meaning of library service "as a common basis of unity and like-mindedness . . . of humanity,"[1] and explain it to its community, as a help to individuals in their interaction with the marketplace (Nader, 1974). It should also define library aims, functions, purposes, and meanings in terms of social order (Berthold, 1933), with principles of librarianship serving as guides for the profession (Danton, 1934).

It is a thesis of this book that a satisfactory philosophy of librarianship must be hospitable to the variety of issues discussed in this chapter. A model is proposed later in this book that would attempt just that, by viewing library-related activities on three interrelated levels: (a) empirical, stressing scientific problem-solving methods; (b) cultural and motivational methods, reflecting the library heritage of dedication to the improvement of physical aspects of human conditions; and (c) rational analyses of logical relationships between basic axioms of librarianship that give it its meaning.

## 6.3 Philosophers on the Philosophy of Librarianship

Some issues of fundamental importance to librarians are also of interest to professional philosophers. I selected here for a brief discussion three contemporary philosophers: Abraham Kaplan (1964), addressing a metaphysical meaning of librarianship; Jose Ortega y Gasset (1934), discussing the ethical obligations of librarians; and Karl Popper's (1972) epistemological three-worlds hypothesis, in which the physical library can be placed in his world 1, subjective reading experience in world 2 and objective products of human mind, such as books, in world 3.[18]

(a) Kaplan described the nature and role of librarianship as a metascience, not dealing with the nature of reality but with ideas describing that reality. As a social memory of ideas, librarianship's central concepts are structure, order, and form, as contrasted with science's focus on substance and content.

This is the humanistic basis of librarianship: "Everything in the library must ultimately be related to its uses, and these uses in turn must ultimately be dependent upon the users." [19]

In many senses, librarianship is similar to philosophy; the domain of both is the total culture and knowledge, and both philosophy and librarianship are expected "to be prepared under suitable conditions to be helpful with regard to any and every area of human concern."[20]

Wright (1977) elaborated on the Kaplan notion of a conceptual relationship between philosophy and librarianship by arguing that information per se can be a referent for philosophical studies but not the object of a science, since it is a conceptual not a physical phenomenon and as such it cannot be a subject of scientific study of material reality.[21]

(b) The distinction between the physical and metaphysical aspects of a generic book was expanded by Ortega[22] into the ethical consideration of librarianship's moral obligations to 'tame the book'. "Up until the present, the librarian has been principally occupied with the book as a thing, as a material object. From now on he must give his attention to the book as a living function. He must become a policeman, master of the raging book."[23]

The reasons for this new mission are, according to Ortega, threefold: (1) there are too many books published nowadays, creating a serious problem of retrieval and requiring new approaches to the descriptive and selective bibliographies on specific subjects; (2) many books are worthless, "a dead weight upon humanity,"[23] calling for librarians' control of book production; and (3) "people read too much . . . the common man . . . does not think over what he has read" and therefore the librarian must direct the patron's reading patterns by becoming "the doctor and the hygienist of reading." Librarians must act as filters of ideas. [24]

Asheim (1982) interpreted Ortega's mission of the librarian as 'a filter interposed between man and the torrent of books' in terms of a need to provide "some means for scanning, processing, and selecting -- from the domain of total information -- that part of it which meets each individual's needs."[25] Otherwise, the abundance of information available but not fully absorbed will result in information overload and entropy. However, Asheim made a fundamental distinction between two kinds of filters performed by librarians: (1) original selection in building library collection for potential users, and (2) assistance in meeting specific patrons' individual information needs, "to make it possible for the users to act as their own filters."[26]

McConnell (1992) praises Ortega for assessing the role of librarianship in the metaphysical framework. Ortega extended the Aristotelian principle of considering librarians qua librarians, i.e., 'in and of itself,' to librarians' professional mission to "be the keepers of the social necessity the book . . . the reason for not only the existence of librarians but their purpose and value as well lies in the very nature of life itself."[27]

On the other hand, Sosa and Harris (1991) rejected Ortega's definition of librarians' mission. "Given his attitude toward mass man and his faith in the intellectual elite, it comes as no surprise that he would view the control and the production and the deployment of knowledge as the proper function of a rational, disciplined, and virtuous cultural elite."[28]

The authors of the essay claim that Western librarians were attracted by the 'cultural uplift' aspect of Ortega's philosophy, ignoring, however, Ortega's authoritarian and elitist method. This lead to "an essential contradiction in the philosophy of library service . . . [by librarians affirming the roles] as cultural 'guardians' while at the same time insisting that they are neutral 'custodians,' "becoming a part of the familiar controversy about 'selection versus censorship'" [29]

(c) In arguing for objective knowledge, Popper divided reality into three separate, but interacting worlds or universes: "first, the world of physical objects or of physical states; secondly, the world of states of consciousness, or of mental states, or perhaps of behavioral dispositions to act; and thirdly, the world of *objective contents of thoughts*, especially of scientific and poetic thoughts and of works of art."[30] He called "the physical world 'world 1,' the world of our conscious experiences 'world 2,' and the world of the logical contents of books, libraries, computers, memories, and suchlike 'world 3.'" [31]

Popper's distinction becomes popular among librarians and information specialists, who embraced the metaphor of World 3, as the foundation for information science. However, Rudd (1983) took an exception to the definition, pointing out to omission in it of the content of information and the social context of its development. He claims that a confusion between World 2 and World 3 was created by Popper's vague definitions of the term 'objective' knowledge in World 3. It was first made objective merely by the fact that it was printed; then, in his later definition, objective knowledge becomes an expression of a 'correct' consensus on its objectivity. This confusion reinforces the "interesting homology between particular socio-cultural configurations and their knowledge structure,"[32] making objectivity subject to different interpretation. This, in turn, leads to a notion of differently understood, fragmented objective knowledge, assigned to a number of different World 3's. In response, Brookes

(1984) defended Popper's definition of objective knowledge by arguing that Popper's "scientific 'truths' . . . are merely the firmest conclusions that can be drawn from the evidence available at that time; any scientific 'truth' therefore remains always open to revision in the light of new evidence."[33]

Neill argues strongly in favor of applying Popper's philosophy to the theory of library information science. In his 1985 essay he related Popper's model to the reference process in two ways.[34]

(1) He compares the reference's problem-solving situation to Popper's problem-solving schema, based on the epistemological model of evolutionary growth of knowledge. The model describes a simple progression of new knowledge that begins with the identification of a starting problem. It leads to a tentative theory about the possible solution, followed by critical error-elimination stage, and ends in the problem situation that emerged from the process. A solution to a given problem is a starting point for the emergence of a new problem and the next stage of the inquiring process.

Neill compared this model with the normal reference routine of initiating inquiry about the patron's motives for asking the question (to understand the issue by reference librarian), followed by a diagnosis of the problem (developing a tentative theory and testing it by initial search for information), rechecking located data in terms of needed information, and patron's feedback on reference librarians' final answer.

(2) Neill next applies Popper's ontological concept of the three worlds to describe the complexity of librarian-patron relationships. The multiplicity of these relations is illustrated by the possible interactions between World 1 (the physical world of the library), with World 2 (subjective worlds of patron's and librarian's experiences), and World 3 (logical contents of human products, such as in books).

In his 1987 essay Neill points out the basic similarities in the interpretation of information by Popper and Dervin, in spite of fundamental differences in their viewpoints.[35]

The two authors use different metaphors to describe their world hypotheses.

| Popper | Dervin |
|---|---|
| World 1: Physical world | Information 1: description of reality |
| World 2: World of conscious experiences | Information 2: creation of images of reality |
| World 3: World of logical contents of records | Information 3: reflection of personal concept of reality. |

The two models, Neil argues, are similar with respect to the interpretation of the 'public' reality within the context of common interest. This is true at least at three levels: (1) World 3 contains an internalized common knowledge of reality and Information 3 describes the process of interpreting that reality.

(2) Both writers agree that there is no pure perception of reality, no pure datum (Popper) and no pure message about it (Dervin). (3) All knowledge is self-begotten (Popper), and the information is an incomplete construction with missing elements initiating a need for more information (Dervin).

Popper and Dervin share with many others the basic problem in developing intellectual access to recorded knowledge, which is "the tension between the fluid uniqueness of the individual inquirer and the essential stability and concreteness of the store of knowledge itself. One of the most important problems . . . [is] the relative 'fluidity' of information stored electronically."[36]

## 6.4 Critique of the Philosophical Approach to Librarianship

Criticism of the approaches to philosophy of librarianship, although small in volume, is scattered over many issues. Some examples follow.

(a) There is no philosophy of librarianship, only a philosophy of life as it applied to librarianship (Haugh, 1953). Attempts to preserve everything indicate a lack of philosophy (Harley, 1953).

(b) Philosophy of librarianship is an elusive concept, synonymous with 'purposes' and 'ruling principles' of librarianship (Irwin, 1949). The term 'philosophy of librarianship' is inexact; it should be replaced by terms such as 'library thought, theory and science,' since no single, all-inclusive theory of librarianship is possible (Vleeshauwer, 1964-65). It lacks intellectual orientation and a clear definition of goals and motives (Rao, 1961).

(c) Philosophy of librarianship does not reflect library functions. Library should not be a desired end of philosophy of librarianship, since the basic relationship is that between books and readers, and the primary function of librarians is a 'book-mindedness,' not 'library-mindedness' (Miller, 1936). Library functions are not synonymous with library philosophy (Emery, 1971).

(d) Philosophy of librarianship refers to a field which is a hybrid of different things. Librarianship is a communication system, a part of general systems; supreme as a collection, weak in its retrieval (Orr, 1977). The ALA's interpretation of library mission as 'best books for largest numbers at least costs' is a shopkeeper's superlative only (Roden, 1923).

(e) Existing theories of librarianship are insufficient to be used as models for library education in a contemporary information system (Robert Williams, 1986). Democratic ideals of American philosophy of librarianship were -- according to the communist interpretation -- 'betrayed by a capitalistic society' (Rovelstad, 1974), while Wright's approach is doctrinal (White, 1978).

(f) Some criticism of the philosophy of librarianship refers to its focus on form, order, and structure at the expense of the relationships between organization of knowledge as knowledge graphically recorded and knowledge's content. The distinction often overlooked in the theory of librarianship is between librarians and teachers. Librarians do not disseminate the content of records by teaching, but by organizing and serving the records (Pauline Wilson, 1979). The term 'perfection' implies status quo and should not be claimed in library theory or practice (Wooster, 1955)).

(g) Bergen (1981) criticized the metaphysical approach to the philosophy of librarianship for lacking a dialectical interplay of ideas and matter. Specifically, he pointed out to Kaplan opposition to empiricism of library practice and Rawski's expression of the same enchantment with form over substance. Wright, according to Bergen, argued for the metaphysics detachment from practice, Nitecki and Fairthorne displayed similar detachment from substance, and Shera's social epistemology is subject to intervention of ideology.

Bergen's main point is that form cannot be separated from substance, and that librarians cannot be preoccupied with structure alone. He claims that the materialism of the biologist has affected idealism by materializing the concept of mind, thus damaging the metaphysical distinction between structure and substance.

(h) Emery (1971) argues that librarianship as a secondary activity has no philosophy, and its focus on purposes, ideals, guides of conduct, or functions are poor substitutes for philosophy. Librarianship should instead be defined in terms of its theory or theoretical principles.

None of the critical points made above could be answered in toto by suggesting an all-inclusive philosophy of librarianship, since it is not possible to develop a total understanding of reality. But some criticism can be addressed by closely delineated models, with paradigms defining their objectives and limits.

## NOTES

1. Borden, A. K. (April 1931). "We Need a Philosophy." *Libraries* 36, p. 176.

2. Coney, D. (July 1939) "Review of Library of Tomorrow," E. M. Danton (ed.); a symposium. *Libray Quarterly*, 9, p. 4

3. Shera, J. H. (1965). *Libraries and the Organization of Knowledge*. Hamden, Conn.: Archon Books (edited and with an Introduction by D. J. Foskett, with a few modifications of the original text made by the editor), p. 176.

4. Passmore, J. (1967). "Philosophy." In *The Encyclopedia of Philosophy*. vol. 6. New York: Macmillan and Free Press, p.

224, passim.

5. Ibid., p. 216.

6. See also the discussion and illustration of the evolving objectives of the library in Chapter Seven.

7. Putnam, H. (July, 1915). "Per Contra." *Library Journal*, 40, (Also reprinted in B. McCrimmon, American Library Philosophy; An Anthology, 1975 pp. 39-50), p. 49.

8. Richardson, E. C. (October, 1927). "The Book and the Person Who Knows the Book." *ALA Bulletin*, 21, 289-295. (Also reprinted in B. McCrimmon, American Library Philosophy; An Anthology, 1975, p. 295.)

9. Lekai, E. A. (1977). "Librarian as a Generalist: An Essay on the Philosophy of Librarianship." *Lacuny Journal*, 5(1), p. 4.

10. Graziano, E. E. (1975). *Language-Operational-Gestalt Awareness*. Tempe, Arizona: The Association for Library Automation Research Communication. (A radically empirical and pragmatical phenomenology of the processes and systems of library experience, p. xi.)

11. Oboler, E. M. (Spring 1979). "The Purpose of a Librarian." *Utah Libraries*, 22(1), p. 22.

12. Ibid., p. 242

13. In response to the editorial criticism in Wilson Bulletin (1936) generated by his reference to money rather than to the social role of the librarian, Orman later revised his position, to the one summarized above.

14. Vleeschauwer, cited by I. Iben (October 1962). "Library 'Deontology'." *The Library Quarterly*, 32(4), 304-308.

15. Kochen, M. (1983). "Library Science and Information Science." In F. Machlup and U. Mansfield Machlup (editors), *The Study of Information*. New York: John Wiley, p. 374.

16. Gardner, F. M. (August 1964). "Presidential Address." *Library Association Record*, 66, p. 334.

17. Richardson, E. C. (October, 1927), op. cit., p. 700.

18. At the time of the publication of the essays cited here, Abraham Kaplan was a professor of philosophy at the University of Michigan. Jose´ Ortega y Gasset was a Spanish philosopher and political scientists, and Karl Popper, philosopher of science and politics, was Professor Emeritus at the University of London.

19. Kaplan, A. (October 1964). "The Age of the Symbol -- A Philosophy of Library Education." *Library Quarterly*, 34(4), p. 296.

20. Ibid., p. 304.

21. Wright, H. Curtis (1977). *The Oral Antecedents of Greek Librarianship*. Provo, Utah: Brigham Young University Press (Foreword by Jesse H. Shera; Afterward by H. J. de Vleeschauwer), p. xiv, passim.

22. An essay under the title "The Mission of the Librarian," read by Ortega to the International Congress of Bibliographers and Librarians in Paris in 1934, was translated and edited by James Lewis and Ray L. Carpenter, and published in *Antioch Review*, vol. 21, no. 2, Summer 61.

The translation of Ortega's address delivered at the second International Library and Bibliographical Congress at Madrid in 1935 was made by Helen Muller under the title "Man Must Tame the Book" and published in *Wilson Bulletin*, vol. 10, no. 5, January 1936.

Although the themes of both papers are similar, the 1934 version of the essay is more extensive and includes a historical review of librarians' duties.

23. Ibid., p. 151.

24. Asheim, Lester (July 1982). "Ortega Revisited." *The Library Quarterly*, 52(3), p. 215

25. Ibid., p. 215.

26. Ibid., p. 221.

27. McConnell, J. C. (1992)." De Metaphysica Artis Bibliotecarii." *Libri*, 42(1), p .60.

28. Sosa Jorge F., and M. H. Harris. (1991). "José Ortega y Gasset and the Role of the Librarian in Post-Industrial America." *Libri*, 41(1), p. 9.

29. Ibid., p. 11.

30. Popper, K. R. (1972). *Objective Knowledge; An Evolutionary Approach*. Oxford: Oxford University Press, p. 106.

31. Ibid., p. 74.

32. Rudd, D. (October 1983). "Do We Really Need World III? Information Science With or Without Popper." *Journal of Information Science*, 7(3), p. 100.

33. Brookes, B. C. (February 1984). "Popper's World." *Journal of Information Science*, 8(1), 39-40. Letters to the Editor column, p. 39.

34. Neill, S.D. (Spring, 1985). "The Reference Process and the Philosophy of Karl Popper." *RQ*, 24(3), 309-319.

35. Neill, S. D. (September 1987). "The Dilemma of the Subjective in Information Organization and Retrieval." *Journal of Documentation*, 43(3), p. 208.

36. Ibid., p. 208.

# CHAPTER 7: EMERGING PHILOSOPHY OF LIBRARIANSHIP

## 7.1 Introduction

In this chapter I summarize the views of the reviewers of the literature in the philosophy of librarianship and discuss their major themes. I also review different approaches to the definition of knowledge by sampling models developed by the writers in the field, each representing a different world hypothesis. A table in the appendix list all authors covered by each reviewer.

## 7.2: Reviewers of literature in philosophy of librarianship.

### 7.2.1 Patricia Peirce, A Study of the Philosophy of Librarianship, 1930-1950 (1951).

This master's degree thesis is probably the first chronological compilation of writings on philosophy of librarianship, covering essays published in English between 1930 and 1950.

Written in a form of a paragraph bibliography, the study focuses on the institution of the library rather than on the field of librarianship, interpreting library philosophy in terms of library goals rather than the theories or models of librarianship. One reason for this approach is of course a lack, at that time, of a well-developed philosophy of librarianship.

Peirce arranged the contributions of the thirty-seven authors published in the period between 1925 and 1950 in four chronological chapters. As she pointed out, "prior to 1930 the subject received little attention from the writers in the field."[2]

The main focus of the study is on the U.S. public library, considered as a social agency dedicated primarily to the welfare of an individual by facilitating the patron's education through reading. The emphasis is on the book as a tool, however, not on its content.

Commenting on a lack of a well-developed philosophy of librarianship, the author stresses constant change in library functions and scope, suggesting that the change itself, in Bergson's sense, may be the only enduring library philosophical principle.[1]

The lack of a philosophy of librarianship is explained by the lack of interest in the theory (Butler, 1933), caused by a pragmatic orientation of librarians (Joeckel, 1932). The argument for a philosophy is prompted by a desire for professional status (Berthold, 1933) and for clarification of the uncertain scope and purposes of librarianship (Wheeler, 1946).

Peirce comments that the essays reviewed by her create an impression of a search for respectability by expressing a need of belonging, by glorifying the function of selection and custodianship of library material, and by linking librarianship with education as a better established profession.

This rationale is reflected in confusing, or fusing the library's objectives with its attributes, as if to say that, since the chair is to seat on, the function of a chair's dealer is to promote sitting activities.

### 7.2.2 McMullen, Haynes: Research in Backgrounds in Librarianship (1957).

This brief review summarizes the views of the critics of the philosophy of librarianship who argue that each library reflects merely a philosophy of the community it serves; or that library philosophy itself should be merely a reflection of commonly acceptable general philosophy. Many writers in the philosophy of librarianship agree with the above limitations but claim that some philosophical principles can be developed from the basic ideas of librarianship. Thus, for example, Ranganathan's five laws of library science (1931) offered guides for library operations; Broadfield (1949) argued for the library primary function of preserving individual patrons' right to freedom in selecting reading material; Irwin (1949) considered bibliographical knowledge and technique as the essence of librarianship; Butler (1933, 1944, 1952) focused on library responsibility for the preservation of scholarship; while Madden (1951 a-d) aimed at reconciliation between library responsibilities to the society and individual.

The discussions of library relationships to society and government, represented by the two works listed by McMullen, are Garceau's (1949) study of American public libraries' relations to local government and the U.S. Office of Education (1956) report on the status of state library agencies.

McMullen notes that philosophy of librarianship cannot be considered research in a narrow sense, if it is defined as an inductive process, but could be considered a research in a broad sense as a study that "carefully considers the validity of data and reaches conclusions through the application of reason."[3]

The author also noted a lack of any theoretical justification for the belief, popular in United States, in the library's responsibility for serving democratic goals of the society.

Among other contributors to what McMullen calls a library background are McColvin (1956), Ditzion (1947), Shera (1949), Thompson (1952), and Vleeschauwer (1955). All their essays are reviewed for their contribution to the library history, rather than to its philosophy.

### 7.2.3 Mukherjee, A. K. Librarianship; Its Philosophy and History (1966).

The author relies heavily on quotes from other writers, selectively summarizing their views as they relate primarily to the social and ethical aspects of librarianship, considered in a historical context.[4]

He emphasizes two aspects of librarianship: the pragmatism of library performance, and the library's social heritage. As one of the oldest social institutions, the library closely parallels its society's emerging culture in terms of its viewpoint.

Philosophy of librarianship is considered a core of the discipline, necessary for understanding any library activities. Mukherjee maintains that although it is elusive, its value is in providing a systematic body of general concepts which validate library processes and clarify its purposes.

Mukherjee lists the following assumptions as the bases for philosophy of librarianship. (a) The discipline is based on social process bound with the life of community. (b) Library's social role is to educate, inform, and entertain; it provides tools for needed information and knowledge. (c) It contributes to the development of new ideas by stressing the reading habit and by means of patrons' and librarians' sensitivity to group interests and community values. (d) Librarianship is defined in terms of its purposes, goals, and relationships to other disciplines.

Among the purposes of the library, especially the public library, the author lists the provision of material for the informational, recreational, and self-developmental needs of an individual patron.

Ethical issues are reviewed in terms of the objectives of specific types of libraries. Mukherjee developed a long list of items which describe an ideal librarian as a model to be followed. The list is based on belief in the value of librarians as keepers of books, selected for the furtherance of learning. The responsibilities of librarians include promotion of society's culture, professional neutrality, opposition to dogmatism and to the mediocrity of mass culture, and support of six basic freedoms: of thought, of speech, of press, of dissemination of knowledge, of instruction, and of freedom to study. Dedication to service is reflected in considering each reader as an independent individual, free to pursue his or her own interest.

Operational aspects of philosophy of librarianship are discussed in terms of Ranganathan's (1963) five laws[5] and Broadfield's (1949) justification of library techniques in terms of their value to the patron. Selection of reading material is defined as a rejection of inappropriate books. Classification is designed in terms of its value to reference, cataloging is viewed as a finding device, and open stacks are seen as providers of free access to collections. Makhurjee favors centralized processing and decentralized services.

The library should be perceived as one big reference institution, combining the scholarly background of the librarian with his or her technical proficiency and broad humanism.

A trend is foreseen toward: a growth of nationalism and democratization, increased access to collections, fast-expanding technology of processing through automation, improved education for librarianship, and emergence of comparative librarianship.

The author identifies but does not discuss the possible resolutions of some philosophical issues created by the divisions within the discipline: among librarianship, library science, and the art of librarianship.

The most frequently cited authors are Broadfield, Nitecki, Foskett, Danton, Irwin and Ranganathan. Among major omissions are lack of references to the essays of Shera and Wright.

Foskett (1967) criticized Mukherjee's study for its overdependence on secondary sources and for many factual errors in his historical analyses.

7.2.4 Downs, Myrna W., The Emergence of a Philosophy of Librarianship in the United States (1969).

In this master thesis, Downs sketched the historical background for the emergence of philosophy of librarianship in the United States. She pointed out that the need for this philosophy is a recent development, paralleling an emergence of a postrevolutionary public library and of the market system. "A correlation exists between economics and libraries, between the market system, the profit motive, and the growth of libraries," all requiring "a philosophy, a principle, a raison d'être to guide its continuing growth and complexity."[6]

From ancient civilization to modern times societies were governed authoritatively, personal wealth was discouraged, and the concepts of land, labor, and capital were not yet developed. This situation changed with the emergence of nationalism and Protestant ethics in Europe, encouraging learning, individualism, acquisition of wealth, self-reliance, the emergence of the public library, and reading.

Downs concluded that the philosophy of librarianship began in the nineteenth century, preceded by isolated philosophical contributions of Naudé, Schrettinger, and Ebert.

Following library conferences of 1853 and 1876, the American Library Association was founded, and new "philosophical principles of innovation, service, entertainment . . . adult education . . . [and] an extremely significant principle . . . [of] 'know your community'' were introduced.[7] 'Know your community' made the library responsible for serving a variety of publics and public goals.

Downs listed as major contributors to the philosophy of librarianship Green, Dewey, Butler, and Shera. In the abstract to the report her adviser, R. Krzys, added Wyer, Broadfield, Ranganathan, Irwin, Butler, Carnovsky, Haines, and Asheim. He noted that these contributions, although "worthy of adherence . . . , were never formally adopted by all the individual members of the profession."[8] The ALA's 'Bill of Rights (1939) and the 'Freedom to Read' statements of 1953 marked the beginning of philosophical awareness by the library profession.[9]

The opening of the first library school (1884) led to the acceptance of librarianship as an academic discipline, composed of several specializations, each developing its own philosophical principles.

### 7.2.5 McCrimmon, Barbara, American Library Philosophy (1975).

McCrimmon, in her review of selected American essays in the philosophy of librarianship, pointed out the 'unity in the diversity' of the viewpoints expressed in them. Different librarians formulated a similar message with different surface accent.

The consensus among the writers includes a notion of the importance of a library in American culture and an encouragement of reading for good citizenship, pleasure, and knowledge. The library is a part of a social structure serving different individual patron and group interests. Its overall purpose is to conserve and make available records of mankind, to stimulate a desire for searching new meanings, and to tolerate different viewpoints.

Philosophy of librarianship is a part of a societal communication network, storing and disseminating world knowledge. McCrimmon classified discussions on philosophy of librarianship into three periods: In the nineteenth century the library was perceived as an extension of public education by Dewey (1897), Dana (1906), and Foss (1909); and the librarian was seen as a bookman by Bostwick (1907), Putnam (1915), and Richardson (1927). In the period between 1930 and the 1940s two trends were predominant: a new, sociological approach to the study of librarianship represented by Danton (1934), Martin (1937), and Goldhor (1942), and continuing focus of bibliophiles on book content and its impact on an individual reader, expressed in the essays of Sayers (1950), Haines (1950), Butler (1953), and Powell (1954). In the decade of the 1960s a variety of issues were emphasized: Shera (1961) discussed the impact of electronics on the field; Nitecki (1964) developed a philosophical approach; the traditional, humanistic viewpoint was elaborated by Marco (1966); Harlow took the scientific approach (1969); and an idealistic respect for graphic expression of knowledge was promoted by Shores (1971) and MacLeish (1972).

The important characteristics of a good librarian, according to McCrimmon, include knowledge of books, professional motivation, and interest in individual patrons' needs. The emerging themes of the philosophy of librarianship include: (a) library operational objectives, purposes, and use, (b) aims and objectives of librarianship, (c) professional consciousness, (d) theoretical foundation based, in United States librarianship, on faith in democracy, appreciation of the power of education, and dedication to the general welfare.

The theoretical foundations of librarianship were discussed either (a) in terms of responsibility for businesslike provision of useful reading material for information or entertainment, or (b) in terms of book content, offering assistance in personal development of individual patrons through reading. The differences between the two views were noted: the former leans toward 'mass culture' and the latter concentrates on individual patrons. Both are sociological approaches.

Library environment is conditioned by cultural, political, and economic factors with two primary responsibilities in democracy: to guarantee individual freedom and to fulfill its social responsibility.

### 7.2.6 Foster, Marie. Philosophy of Librarianship (1979).

Foster provided a succinct summary of major philosophical writings. Irwin considered the philosophy and the definition of librarianship as one and the same statement of aims and relationships with other disciplines. Christ identified library philosophy and its functions as synonymous. Butler (1933) viewed it in the context of society. Broadfield's (1949) first priority was service to the individual. To Foskett, the librarian should be the patrons' alter ego. Shera (1973) incorporated the other views in his socio-epistemological philosophy of librarianship. Kolitsch (1945) recognized the impact of the society's political philosophy on the philosophy of librarianship. Burke (1947) argued for Christian democracy. A broader approach to the definition of library philosophy was represented by Houle's educational, research, and recreational priorities (1946). Shores (1971) stressed the notion of generic book, and Thompson (1974) the concept of library power. Rao (1961) and Nitecki (1964) took the categorical approach. The former identified four modes: actional, organismic, naturalistic, and and reflexive, the latter described the procedural, contextual, and conceptual dimensions of librarianship. Bekker (1976) distinguished between three usages of library philosophy: as a frame of reference, as a purpose-defined function, and as a statement of occupational ideals.

The author developed a survey of students and faculty in two Canadian library schools to determine the philosophical influence of the faculty on library students. She concluded that while the philosophy of librarianship exists, its different interpretations are accepted for different reasons, with little if any influence of educators on individual students' own philosophy. In general, the personal philosophy of the individual determines their choice of a philosophy of librarianship.

Foster outlines four philosophical models in librarianship: (a) custodial, focusing on intrinsic worth and conservation of library material, (b) humanitarian, stressing contributions of library collections to knowledge, (c) mediating, relating a library to the development of its patrons, and (d) promotional, describing a library as a community service.[10]

### 7.2.7 Whitehead, J. M. Logos of Library and Information Science: Apperceptions on the Institutes of Bibematics with Commentaries on the General Humanistic Method and the Common Philosophy (1980).

This doctoral dissertation is concerned with the development of a philosophy and methodology for library and information science. The author complains that there are no universally accepted philosophy of librarianship, no philosophical building blocks, and no methodology that could be used to develop such philosophy.

The book discusses the philosophical background in three parts: the colonial period, up to 1933, the classical period, between 1933 and 1940, and the modern period, from 1940 to 1980. In the early part of the colonial period, until 1850, the role of the librarian was performed to a large extent by students dedicated to intellectual self-improvement. In the second part of that period, between 1850 and 1933, librarian's role changed to that of a teacher, with a simultaneous emergence of the public library movement. In the classical period, Butler (1933) represented a sociological school of thought which viewed a librarian as a scientist, sociologist, psychologist, and historian. Shera (1972, 1973, 1976), Taube (1961), and Daily (1957, 1972) based their writings on a humanistic notion that thoughts precede the service itself in a service oriented philosophy.

The modern period of library philosophy is subdivided into five distinct phases, each characterized by different types of librarians focusing on different aspect of librarianship. (1) The political approach concentrated on the issues of democracy (McLeish, 1940). (2) Language issues and linguistic methodology were expressed in the philosophy of classification (1945-1960). (3) Applied mathematics and the concept of irrelevance of meaning were introduced in information theory (Shannon and Weaver, 1964). (4) This phase was extended to librarianship by the mathematician -librarian Ranganathan and his five laws of library service (1960-70). (5) The last phase marked the beginning of philosophical writings.

Whitehead singled out Broadfield (1949), Mukherjee (1966), Butler (1933), Ranganathan (1957, 1967), and Shera (1972, 1973, 1976) as major writers in the philosophy of librarianship. He also identified philosophical influences on library classification systems -- e.g., Francis Bacon's influence on Melvil Dewey, and Comte's classification on Richardson, Sayers, and Ranganathan.

According to Whitehead, philosophy of library and information science cannot be defined. It can be found only by doing philosophy. The theory of librarianship goes back to (a) Greek dualism, which distinguished between mind and matter, idealism and materialism, (b) the dialectics of Plato, introducing the question-and-answer methodology, and (c) Hegel's dialectics of thesis, antithesis, and synthesis.

Any idea develops into a philosophy by means of common notions. Form and substance interact, producing laws. Functions such as cataloging or reference are forms operating on the substance of library and information science activities, while functional divisions produce functional organization of a library into departments.

In the dichotomy between empiricism and rationalism the author focuses on relative pragmaticism, a rational equivalent of logical positivism.

Whitehead's methodology is derived from the technique of oral history, similar to the Delphi method but with added feedback, called by him a 'humanistic method'. That approach, instead of aiming at the consensus, attempts to strengthen individual authors' concept of library sine qua non. In this respect, it is similar to Socratic dialogue's philosophical induction.

Whitehead maintains that all knowledge is basically an error. He argues that the closer knowledge is to truth, the longer its errors last, since it is more difficult to apperceive errors in a complex theory of knowledge. His philosophical logos of librarianship distinguishes between two kinds of philosophical trends: (1) from empirical to rational; (2) and its reverse, from rational to empirical.

Whitehead presents his review of philosophical issues in a form of a dialogue. He describes the dialogue as mythological, with no direct reference to the published works of the authors participating in it.

In this dialogue, Ortega y Gasset (1961) argues for purity of information as means for screening undesirable books. He is criticized for defending the form of material (book) at the expense of the institutional function, to preserve the materials and make them available when needed.

Trezza favors equal opportunity of access to all libraries by anyone who wants it. He is criticized for his assumption that the user always knows what he wants.

Licklider focuses on scientific procedure to organize and make material available. To him, the substance does not matter.

Lorenz stresses the importance of the informal education offered by the library. Daily (1957) sees the importance of a library not in ethics but in science and professionalism.

Debons (1974) maintains that the logistics of managing the information is of more concern to a librarian than the users' needs.

Kent (1974, 1976) concentrates on methodology in search of solutions of 'unsolvables' by means of a study of losses and gains in the process of information transfer.

Shera argues for optimization of the utility of graphic records for the benefit of the individual and, through him, of the society.

Whitehead is not fully satisfied with the method used because it resulted in skipping many steps in the dialogue. He ends his dissertation with a plea for a philosophy of librarianship.

Attachments to his book include Shera's interpretation of what he calls a library's sine qua non: the notion that books as depositories of experiences are of critical importance to the substance of librarianship. The library represents a form of unstructured learning, with the individual being free to select what he wants; the purpose of education is to instill in people the desire to know. Of particular interest is Shera's comment that we think in terms of relations because that is the way our brain works.[12]

### 7.2.8 Rogers, A. Robert and K. McChesney. The Library in Society (1984).

In his chapter "An Introduction to Philosophies of Librarianship" Rogers discusses in some detail essays of Ranganathan (1931, 1951), Shera (1953, 1961, 1961a, 1972), Butler (1933), Dewey, (1898) Nitecki (1964, 1979, 1981), Danton (1934), and Ortega (1961). From these reviews his own concept of the philosophy of librarianship emerges.

The library as an agency of communication includes both holistic and historical functions. However, it lacks advocacy and at times is taken over by aggressive factions of society to serve their purposes. It is a product, not a base, of a society, and therefore it is subject to change in its function and purposes. Modern librarianship began at the eve of the industrial revolution, switching from 'I-awareness' to 'we-awareness.' Development of libraries is directly related to the level of a country's socio-economic status. Its dynamism depends on the librarians' reactions to societal changes and the way they address the conflict between the needs of individual patrons compared with those of the society.

The library role in education varies. Its goals to provide services to the government and to satisfy needs of individual and group interests are interpreted differently in different political systems, as illustrated by the old Soviet and American approaches. In many societies, the public library emerged to meet the needs of democracy or other political systems; it was always dedicated to education of citizens in the prevailing political doctrine.

Rogers points to a noticeable recent shift from the rational and individualistic philosophy to a collective philosophy of the society, from individual to group consciousness.

Contemporary aspects of the philosophy of librarianship are characterized by a focus on self-education in the nineteenth century and on social advocacy in the twentieth century. Library resources are now marketed as if they were any other commodity. In the nineteenth century the main goal was an acculturation and assimilation of new emigrants and their Americanization; in the present century it is preservation of a minority's cultural identity.

The dissemination of library material must be continuous in order to be effective. The library is an intellectual node for the interdependence of its members. The ideology of service can be viewed: (a) horizontally, as different kinds of libraries serving different populations; (b) vertically, as the same library serving different individuals with different backgrounds and needs. The library itself does not have a purposeful mission; it interprets the mission assigned to it by its own society.[13]

Understanding past relationships between library and society helps in developing the philosophy of the profession.

Although social conditions and technology changed in the last five thousand years, the essential mission of the library -- to serve as intermediary between persons seeking access to ideas and their records in library collections -- remained the same.

Contemporary philosophy of librarianship started in the 1960s with the contributions of Kaplan (1964), Nitecki (1964), H. C. Wright (1976, 1978), and Yngve (1981). Rogers enumerates some of its tenants by summarizing the positions of the above pioneers on a variety of topics.

Information is defined as a resource that is renewable, potentially eternal (indestructible), and unique. Library structure is considered as a component of social structure. Library functionalism is described in terms of society as a cause (independent variable) and a library as its effect (dependent variable).

The purposes of librarianship are: (a) to provide a theoretical and conceptual framework, (b) to elaborate on the role of library in supporting freedom of individuals, (c) to respond to collective needs of the society, and (d) to provide a theoretical underpinning for the discipline.

The library is a holistic, comprehensive agency, both in substance -- by collecting known records of the totality of the society's experiences and creations -- and in function -- by relating to other agencies. Its organization reflects society's technological, sociological, and ideological culture. Its primary objective is to meet social needs by serving as a repository of intellectual records, to provide dissemination of knowledge and reference to its sources, to educate, and to serve as an agency for social advocacy on issues such as Americanization, cultural heritage, reading, or outreach services.

Philosophy is an exercise of intellectual curiosity focusing on critical discussions. In library writings the major focus is on a library purpose, with some writers relating librarianship to other disciplines.

Major components of philosophy of librarianship are: (a) statements about fundamental purposes of librarianship, linking a library with some specific division of philosophy (e.g., epistemology, metaphysics, logic, ethics, and esthetics), (b) the principle of the freedom of individual and library provision of access to ideas, and (c) the implementation of a library role to represent and preserve society's cultural contributions.

7.2.9 Shera, J. Librarianship, Philosophy of (1980).

Shera's essay made no references to other writers. It was presented as a general overview of the concept of philosophy of librarianship rather than as a discussion of its specific aspects.

He asked: What is knowledge, how it is learned, and what is its impact on behavior? What does reading to people? What is a metaphysical definition of a book?

Shera begins with a historical sketch discussing justification for the existence of libraries. He started with ancient needs for the custody of records, followed in Middle Ages by focusing on book-centered education and on a need for textbooks. The process culminated in the nineteenth century demand for expensive books that were beyond the means of the individual reader, leading to the creation of the tax-supported public library.

The library serves democracy by providing guidance to immigrants, facilitating adult education and outreach services. It links ideas with contents of records. It is a system that integrates bibliography-based acquisition and order-focused organization with user-oriented interpretation, through mechanistic, physical operations, intellectual resources, and social and intellectual environment. The basic library requirement is to encompass all forms of physical and mental human activities recorded in library collections.

As a social agency the library provides a ground for interrelating people working together to satisfy common needs, with a culture of common knowledge, understanding, and beliefs and with communication.

Librarianship is redefined in terms of social epistemology. It includes all intellectual processes of the society as a whole within a total environment. Its focus is on production, flow, integration, and consumption of all forms of communication.

### 7.2.10 McCrimmon, B. Librarianship, Philosophy of (1993)

In her description of the background to philosophy of librarianship, McCrimmon stressed the historical pattern of library adjustments to the social environment. The adjustment is evident in a recent focus on readers' intellectual enrichment through reading, and on library awareness of its social role.

Although philosophical discussions did not begin until 1876, the philosophical agenda had been slowly emerging from the functions performed by the library throughout the ages. Beginning with the bookkeeping responsibility for the preservation of records, the library occupation was formed at the time of the invention of print, assuming a managerial role of administering printed matter in the seventeenth century, as described by Naudé (1627) and John Durie (1650). The significance of the library was further advanced in the Enlightenment by scholars' involvement in library affairs, such as Leibniz's essay about the impact of classification on readers. Librarians' dedication to serving patrons was expressed by Ebert's motto 'aliis inserviendo consumor'. Panizzi's leadership of the British Library, coupled with the formation of professional organizations in America and England, raised considerably the prestige of librarianship in the Western world. This was the beginning of the articulation of an American philosophy of librarianship. The importance of intellectual freedom was highlighted, and the public libraries' role was defined as community centers supported by citizens' taxes. Under Putnam's leadership the Library of Congress provided important service to all library patrons through its standardization of bibliographic access to records.

McCrimmon reviewed contemporary library philosophy in terms of a traditional dichotomy between the two major philosophical approaches, those of Plato and Aristotle.

Plato's philosophy of an ideal world, expressed in the concept of universals and the notion of the highest values, was transplanted into library philosophical values that exalted the reading of good literature. The library is seen as a memory of civilization and as a depository of intellectual energy; librarianship highly motivated by the love of books is considered more an art than a science. Butler, Haines, Powell, Richardson, and Sayers represent this viewpoint.

The Aristotelian approach began at the Graduate Library School in Chicago in early 1930s. Its focus was sociological, emphasizing the need for research into library functions, based on social science methodology. Shera (1965) and Shores (1971) were the better-known spokesmen for this viewpoint.

To some extent the above distinction was also manifested in the debate between the proponents of idealism and those of pragmatism in library philosophy. Ortega (1934) argued that democracy's dependence on a well-read population elevated the role of librarians to that of controllers of the book trade. Kaplan (1964) considered librarianship a metascience, based on metaphysical concepts of structure. Wright (1986) delineated the distinction between hypothetical information and knowledge by perceiving librarianship as a humanistic discipline, based on ideas, graphic records, and scholarship rather than on material objectives of science. Nitecki (1981) formulated a communication model in the form of a root metaphor, standing for the ideas, originated in the mind of their creator, expressed in a physical medium and interpreted by their receiver. He proposed a study of relationships between these components on physiological, psychological, and philosophical levels. These relationships constitute the subject matter of library philosophy and are to be pursued by metalibrarianship, an umbrella term for information --related disciplines.

Other contributions to the philosophy of librarianship mentioned by McCrimmon included the condemnation of censorship in ALA's Bill of Rights and Broadfield's call for complete freedom of choice in reading. While Foskett (1984), Orr (1977), Wilson, Ranganathan (1931, 1951), Broadfield (1949), and Botasso addressed some aspects of philosophy of librarianship, none proposed an actual philosophy.

### 7.2.11 Partial Reviews of Philosophy of Librarianship

There are in library literature many casual reviews of library philosophy, written as parts of the works on other subjects. Those studies are excluded from a full review in this section, either because of their more narrow scope or because of their focus on a highly specialized viewpoint.

(a) Bekker's dissertation on library professional ethics (1976) is a good example. He dedicated three sections to the philosophy of librarianship,[14] in which he described philosophy in general and discussed briefly library philosophy "as a system of principles for guidance in practical affairs . . . [agreeing with Johannensen, that] . . . an applied philosophy should include standards of conduct for practitioners."[15]

Bekker listed three basic uses of philosophy in librarianship: (1) as a frame of reference, delineating the library's scope and providing for its unity, as suggested by Christ (1969, 1972), Irwin (1949, 1967), and Rothstein (1968); (2) as an explanation of (a) a single notion describing library aims, ends, and objectives, the view represented by Irwin and Broadfield, or (b) its mission in terms of library means rather than ends -- Bekker included Nitecki (1964) in this group; and (3) applications of philosophy in formulating occupational ideals, or guidelines for conduct, addressed by Foskett (1962-1970) and Benge (1870).

Bekker agrees with my own principle, that "these three approaches should not be treated in isolation. They could be interpreted as three dimensions of one basic approach; each supplements the other two in a quest for an acceptable definition of librarianship."[16]

He completes this section by stating what the philosophy of librarianship is not, and why it is needed.

(b) In defining philosophy of librarianship, Buckland (1983) makes a distinction between the definitions that are 'value-free,' and hence synonymous with the definition of 'theory'; or 'value-laden.' He chooses the latter approach and equates the concept of the philosophy of librarianship with that of philosophy, as "a system of motivating beliefs, concepts, and principles." [17] It is value-laden because it relates to social values, determined by many different people. The criteria or value systems vary with the prevailing social philosophy, as seen, e.g., in selection and censorship policies subscribed to in different political systems.

# NOTES

1. Peirce, P. (June 15, 1951). *A Study of the Philosophy of Librarianship; A Review of the Relevant Literature, 1930-1950.* Unpublished master's thesis. The Drexel Institute of Technology, School of Library Science, Philadelphia, p. ii.

2. I assume that the reference is to Bergson's notion of 'élan vital' as a cause for evolutionary changes. According to Bergson, the concept of evolution by itself does not explain the change; it merely traces its progression. Evolution is neither mechanistic nor predetermined, but is instead a relational concept interrelating experiences with the intuitive 'vital impulse' of future alternatives, within the limits of available knowledge (Bergson, 1907).

3. McMullen, H. (October 1957). "Research in Backgrounds in Librarianship." *Library Trends*, 6(2), p. 111.

4. Mukherjee reviews a number of contributions to the philosophy of librarianship. All are listed in Appendix 1. Some of Mukherjee's citations are incomplete, however, some material is quoted but not identified, and some quotations are not enclosed in quotation marks.

5. An interesting footnote to the wording of Ranganathan's second law was provided by Finks (1992, p.627). He pointed out that the law in the first edition of Ranganathan's work read: "Every person his or her book." This was changed in the consequent publications to "Every person, his book." The original phrasing is a testimony to Ranganathan's awareness of women's role in librarianship, while the comment on the change reflects gender sensitivity of contemporary librarians.

6. Downs, M. (1969). *Emergence of a Philosophy of Librarianship in the United States*. Long Island University, p. 2.

7. Ibid., p. 73.

8. Ibid., p. 75.

9. Downs did not identify individual works, nor did she elaborated on the specific contributions of any of the librarians mentioned in her essay. The copy of her master's thesis received from Long Island University does not have the bibliography. Therefore, some writers mentioned by her are not included in my own references.

10. Foster, M. (1979). "Philosophy of Librarianship." *Canadian Library Journal*, 36(3), p. 133.

11. Whitehead, James, M. (1980). *Logos of Library and Information Science: Apperceptions on the Institutes of Bibematics with Commentaries on the General Humanistic Method and the Common Philosophy.* Ph.D. dissertation, Graduate School of Library and Information Science, University of Pittsburgh, p .4.

12. Some of the references above are to mythological dialogue, with no references to specific works given by Whitehead.

13. The supreme rights of an individual in the United States are emphasized by (1) the ALA's Library Bill of Rights, 1939; (2) the Statement of the Committee on Intellectual Freedom, 1940; Intellectual Freedom Manual, 1974; and the Newsletter on Intellectual Freedom and Intellectual Freedom Primer, 1977.

14. Bekker, J. (1976). *Professional Ethics and Its Application to Librarianship.* Unpublished doctoral dissertation, Case Western Reserve University, pp. 98-108.

15. Ibid., p. 101.

16. Ibid., p. 104.

17. Buckland, Michael K. (1983). *Library Services in Theory and Context.* New York: Pergamon Press, pp. 128-139.

# CHAPTER: 8
# THEORIES ABOUT KNOWLEDGE

## 8.1 Theories about theory
### 8.1.1 Introduction

> Librarianship has only marginally attempted to utilize or to build upon or synthesize theories developed by other disciplines, despite the fact that from a methodological stand point it is particularly able to do so.[1]

Shaughnessy explains the lack of interest in theory-building by contending that researchers overemphasize form, order, and structure of knowledge at the expense of studying the relationships between the organization of knowledge as knowledge, and as knowledge graphically recorded. His comment that "the knowledge base of librarianship could exist as a field of study whether or not libraries exist"[2] reinforces the very basic hypothesis of metalibrarianship as a meta-theory extending beyond the traditional paradigms of library and information science.

In LIS most of the theoretical explanations offered up until now were borrowed from other disciplines, often developed for different purposes. "We are unaware"-- Boyce and Kraft maintains -- "of a single theory in information science that suggests a testable phenomenon whose successful observation would add to its credence."[3]

It may be of help to some readers to clarify the distinctions between principles, laws, theories, systems, and models in terms of their relations to reality. Definitional boundaries between these concepts are vague and are interpreted differently in library literature.

8.1.1.1 A principle is an axiom describing the essence of a given phenomenon. Popper defines it as a "simple, new, and powerful unifying idea about some connection or relation [such as gravitation attraction] between hitherto unconnected things [such as planets and apples] or facts [such as inertial and gravitational mass] or new theoretical entities [such as field and particles]."[4]

Ranganathan's five laws are in effect the basic precepts or principles of librarianship, and so are Thompson's seventeen principles. Bierbaum recommends a modified Zipf's principle of Least Effort as a unifying concept for the theory and practice of library and information science. The author links it with the Mooers' Law: "An information retrieval system will tend not to be used whenever it is more painful and troublesome for a customer to have information than for him not to have it!"[5] Other examples of library principles include pronouncements such as Ranganathan's 'Save the time of the reader,' or Cutter's 'convenience of the reader.' Bierbaum wonders about the validity of some such principles: Will Least Effort be turned upon itself as the value of information exceeds the cost of the search or exchange?"[6]

8.1.1.2 Laws are general statements about selected aspects of reality. They are experimentally established and operationally defined explanations of facts that describe reality. Bibliometrics laws in information science are the examples. Bradford's law (1934) describes the productivity of journals determined by a law of diminishing returns. Lotka's law (1926) states that a small number of scientists publish most of the scholarly articles. Zipf's law (1935) provides a formula for determining the frequency of selecting particular words. As Bookstein demonstrated, all these laws are mathematically identical, suggesting "that one reason for the recurrence of these laws is that they are very stable and likely to result from a wide range of different causes."[7]

Most of library principles were formulated in library science, while library laws were developed in information science. Both principles and laws are usually incorporated in models.

8.1.1.3 In theory, knowledge of a particular aspect of reality is systematically organized around some selected principles and laws. In contrast to experimental or operationally defined laws, in theories at least one term does not refer to observable characteristics and cannot be directly tested. Theoretical statements are always subject to revision if they are not consistent with previously determined laws. The criteria of theory are their coherence, simplicity, and plausibility. As a rule they are more general than laws, covering qualitative aspects of phenomena, and they refer to ideal rather than concrete situations. Theories are frequently formulated as systems of statements.

There are three major philosophical views on theory: (1) reductionism, focusing on observable sense-data, (2) instrumentalism, considering theory as a tool for deriving predictions from given data, and (3) realism, formulating theories in terms of 'real' or existing entities.

8.1.1.4 Models describe in a variety of ways different patterns of structures, reflecting different aspects of reality.[8] Hesse identified five major types of definitions of 'models,' all "essential for prediction and for giving semantic interpretation to theories."[9]

(1) Logical models consist of entities that interpret sets of axioms, as, e.g., points and straight lines in geometry reproduce the relationships specified by the axioms.

(2) Models of analogy are either structural or isomorphic comparisons between different kinds of systems, or replication of the parent system. The former analogies are conceptual (e.g., between a swinging pendulum and an oscillating electrical circuit), and the latter express material analogies (e.g., a mechanical part and its copy).

(3) Mathematical probabilistic models provide causal, predictive, and explanatory interpretation of formal systems (e.g., system theory in information science developed as a non-empirical, mathematical concept).

(4) Simplifying models purposefully represent an empirical situation in a simplified form to facilitate a research of its application (e.g., models based on statistical approximations).

(5) Theoretical models may be identical with the theory they represent (e.g., a DNA model identical with the theory of the molecular structure). They are used in place of theories that are not yet well established.

### 8.1.2 Systems

#### 8.1.2.1 Definitions

Library Information Science, as any other science, is a system. In general, a system is defined as "a regular or orderly arrangement of components or parts in a connected and interrelated series or whole."[10] We isolate certain aspects of reality for a closer examination from a particular viewpoint of the relationships within the selected system. "The concept of the system is such that it is possible under any circumstances to stay within the limits of knowledge. It is not required to know the limits but it is required to stay within the limits."[11]

Hall and Fagen suggest the following definition of 'system' that is free of colloquial and misleading meanings: "A system is a set of objects together with relationships between the objects and between their attributes." In this explanation (a) 'objects' are physical or abstract parts of the system (e.g., from physical 'atoms' to abstract 'variables'; (b) attributes are the properties of these objects (e.g., atomic weight); and (c) relationships "tie the system together" (e.g., interrelations between parts of the object).[12]

Mortazavian distinguishes between "philosophy of systems -- a branch of philosophy dealing with problems centered around the notion of system . . . [and] system theory, which is the science of systems."[13]

Philosophically, systems theory relates to the complexity created by the relationships between the whole system and its parts. Holists maintain that "we need to study the whole system to see the big picture,"[14] while methodological individualists insist that "the properties of the whole can be deduced from the properties of the parts."[15]

Another distinction within systems theories, pointed out by Langlois, refers to the causal and goal-oriented approaches. "In the former case, the meaning of a signal is the response it elicits. In the latter, response is also the ultimate criterion of meaning, even if we cannot necessarily understand the meaning of a signal without first knowing the goal that the system is pursuing."[16]

### 8.1.2.2 General Systems Theory

Bertalanffy, in formulating his General Systems Theory, was influenced by a pattern of similarity observed in the development of the same or similar viewpoints in different branches of science. In the past, science followed the methodology of breaking up the phenomena into parts, studying each part independently of others. In contemporary science methodology tends to focus on the wholeness of the phenomena. Bertalanffy further noted that there are formally identical or isomorphic laws found in many different fields. They "are characterized by the fact that they hold generally for certain classes of complexes or systems, irrespective of the special kind of entities involved."[17] All these considerations led him to postulate General System Theory, defined as "a logico-mathematical discipline, which is in itself purely formal, but is applicable to all sciences concerned with systems."[18]

Mortazavian claims that Bertalanffy's theory failed, because it rejected mathematics as a language of science. He distinguishes it from his own definition of a mathematical system. On the other hand, Laszlo maintains that "general system theory is a general theory of systems,"[19] differentiated from special system theories such as Shannon's information, Bertalanffy's biological, Wiener's cybernetic, and other systems in mathematics, sociology, political science, management, communication, and the like. His matrix identified three basic system approaches (scientific, engineering, and philosophical), each subdivided into levels and types. System philosophy, for example, is divided into organic and supraorganic levels, biological/homo and sociocultural types, and are represented by social ethics, social, and political theory, theory of justice, human communication theory, culturology, and technology assessment.[20]

Philosophically, any attempt to limit general systems theory to computer-related problems would, according to Bahm (1973), restrict the theory to a two-valued system of logic only. It would exclude from the theory any implicit interrelations between systems and would not provide for unity among diverse elements within each system. Furthermore, (a) any system is limited by the capacity of the human mind, which is a part of a more complex reality; and (b) in the global sense, multicultural systems will require difficult reconciliation between environmental differences. For example, the Eastern philosophy of reality is based on a priority of unity over plurality while Western philosophy takes an opposite view.

Bahm notes that (a) "polarity is a universal characteristic of existence and hence a kind of structure which needs to be recognized as basic to any adequate general systems theory;" (b) since there "is an element of novelty in every cause-effect situation," its origin should be recognized; and (c) general systems theories must consider not only common aspects of all situations but also unique differences between them.[21]

### 8.1.2.3 General Systems and Librarianship (Foskett)

Foskett was attracted to Bertalanffy's General System Theory when searching for scientific principle that would help developing an integrative classification system.

Bertalanffy formulated principles of 'wholeness' applicable to systems in general. Foskett followed by defining a system as "a set of entities, all of which have a separate existence, and which can unite to form a single new entity of a higher order of complexity, by establishing certain fixed relations between the elements of the set."[22]

This approach contradicted the philosophy of reductionism, which was dominant at the time and offered explanations of all phenomena exclusively in physical terms, rejecting the concept of 'wholeness' as a metaphysical, non scientific concept. The reductionistic notion that everything can be explained in terms of abstract symbols led to equating symbols with reality (Foskett, 1974).

Libraries are open systems aiming at the organization of knowledge, constantly reacting to changes in knowledge structure and its environment. Major components of the library, Foskett notes, reflect organizational characteristics, from mechanical arrangements of words in documents to subject arrangements in a bibliography. "Above all, . . . the theory of classification can claim a truly philosophical basis because it is concerned with the nature and organization of knowledge, a field which has always been central to philosophy." [23]

Foskett summarized the major influence of Bertalanffy's theory on librarianship in three groups: (1) the information function of a librarian is that of a generalist, able to identify for the patron all the subject similarities and differences between individual publications, and their relations to the whole subject. (2) The role of technology, and particularly of a computer, is to improve efficiency, but not to substitute it for intellectual functions of librarians. (3) "The consequence of the systems' philosophical approach is that libraries should never be considered as ends in themselves, as closed systems, but as open systems in constant interaction with their environment." [24]

McMahon considers library as "a system for assembling published materials, developing information services, and disseminating information for use by a client and, as such, it is among the particular class of systems which is open to environmental influences and includes human interaction in the context of carrying out defined tasks."[25] Library management provides a mechanism for balancing primary objectives, the interaction between different library operations demonstrates its system status, and its holistic approach allows for considering librarianship as a total system.

Bellomy looks to the systems approach for the solution of library problems. He describes a system process which involves (a) assembling interdependent data and ideas that are necessary to achieve planned objectives, and (b) considering planning perspectives, availability of needed resources, external and internal constraints, and the degree of urgency in solving given problems.[26]

Bergen, speculates about the library role in the support of an experimental college curriculum based on general systems theory. The library system needed would have to be infrmation- and document-oriented, open, with inductive and deductive capacities, that is capable of providing documents addressing general and specific apects of any issue (Bergen, 1965).

"Systems theory," Foskett concludes, "can be used to stress the importance of studying the relationships into which a library may enter; it can also help in identifying the problems of management within the library itself. The role of the library in any organization is the same as that of any other part of the organization, namely, to help the management to achieve its aims . . . |and| to implement the policy through the exploitation of books and other recorded data."[27]

## 8.2 Theories in Library Information Science: Examples

To illustrate different kinds of theories discussed in LIS, I selected two dissertations and one thesis, each developing or suggesting a different approach to the concept of theory.

8.2.1 Bryson's use of the theory is instrumental, aiming at an explanation of the nature of librarianship. "In this view theories are utilized as tools of inquiry, but are not expected necessarily to describe phenomena which can be directly observed; rather, theories, for the instrumentalist, serve to guide one's description and to assist in making judgments regarding the effects of such descriptions."[26]

Bryson's dissertation is based on Kaplan's (1964a) logical analysis subject to tests of correspondence, coherence, and function. The theory is postulated on three laws: (1) communication-need, (2) organizational development of efforts in preserving knowledge, and (3) division of labor reflected in management of library operations and scholarship.

Based on the above laws, Bryson derived two postulates, one related to the organizational development as emergence of social organization to design functions and utilize needed resources; and the other referring to the division of labor creating tasks to be performed by different assignments. Each of these postulates, in turn, can be further subdivided, into, e.g., teaching in communication, acquisition in organization, or administration in division of labor.

The relationships between the postulates and their subdivisions are represented in the form of a three-dimensional conceptual model, interrelating library functions with individual functions and information need.

The theory is validated in terms of correspondence (semantical norms), coherence (syntactical norms), and pragmatism (functional norms). The end result is a demonstration of a unity of librarianship, expressed by "a consistent set of information-needs . . . of library functions which have been developed to meet these needs . . . [and] . . . of individual functions which it asserts are consistent throughout librarianship."[29]

8.2.2 Bennett in his dissertation proposes a theory of multiple reality "as being multidimensional, multifocused [with] . . . a multiplicity of viewpoints and horizons."[30] This concept of reality is based on Bohm's viewpoint of the universe as a self-consistent whole (Bohm, 1957). Every law formulated about that reality contains errors, because it cannot include all as-yet-unknown qualities and properties of the universe, revealing new contexts and new conditions.[31] "There still exists an absolute, unique, and objective reality. The essential character of scientific research is, then, that it moves towards the absolute by studying the relative, in its inexhaustible multiplicity and diversity."[32]

Consequently, defined reality is, according to Bennett, a fiction, 'a willing suspension of disbelief,' socially constructed to represent the unknown and real universe. The multiple view of reality calls for a methodology that would allow one to move from one interpretation to another, "from trying to understand the part to trying to understand the whole,"[33] and thus increase the perception of both. Bennett selected an interpretative theory of hermeneutics, because it allows him "to move from hermeneutics (interpretation of text) to social contexts (sociology of knowledge), back to texts then to contexts of the development of scientific disciplines (sociology of science) and back to texts."[34]

Bennett uses hermeneutic [35] method in a form of a fictitious dialogue with well-known library theoreticians to define and explain the concepts of librarianship in all its derivations, from social positions of librarians as scientists to a historical interpretation of the discipline.[36]

Hayes, in his review of Bennett's essay, called this method a 'content analysis' or a 'discourse analysis' of the texts and their authors. He criticized the method as self-fulfilling, allowing the researcher to find, in the selected passages, his or her own interpretations of the reality (Hayes, 1989).

8.2.3 The main objective of Menzel's master's thesis was to review Barfield's contributions to epistemology as a possible framework for philosophy of librarianship. He endorsed Barfield's rejection of empirical science and its replacement by transcendental methodology. He also questioned the present definition of librarianship and its functions.

In his review of Barfield's philosophy of knowledge, Menzel stresses the importance of the immediacy of knowledge, which is expanded and internalized by using metaphor. "Romanticism emerged as an attempt, through imagination, to do consciously what the ancient or pre-logical mind did unconsciously."[37]

Barfield identified two levels of knowledge: human consciousness and its transformation into commonplace knowledge. He also divided consciousness into three levels: as an intuitive process

(Plato's images), observation and acknowledgment of sense perception, and reflective, theoretical thinking. All three levels of consciousness are concerned with appearance: "the first with construction, the second with acceptance, and the third with explanation."[38]

Plato's fourth level, knowledge, was transformed by Barfield into beta-thinking, 'reflective thinking about thinking,' while Plato's highest level of cognition, intelligence, was designated as an 'advanced form of inspiration.'

Transcendental philosophy contradicts the rationalist philosophy of Descartes in its focus on pre-empirical facts and on methods of knowing rather than on the known facts. Librarianship, Menzel implies, should build its theory on the transcendental principles of Barfield's philosophy.

In his concluding chapter, Menzel criticized Shera for not developing the call for epistemological foundations of librarianship. "Shera actually fails to support his position because he does not offer anything which is really new . . . his support for a librarianship that is concerned with the 'management of knowledge' betrays the poverty of his position and a weakness in the field of library science as a whole."[39] By implication, Menzel suggests that before claiming epistemological foundations, librarianship ought to clarify its position on the preferred epistemological viewpoint.

### 8.3 Explanation and Understanding of Reality

Philosophical and psychological issues related to the distinction between explanation and understanding of the multiple realities are also pertinent to metalibrarianship. I again selected three essays for brief comparison.

8.3.1 In his emphasis on Bohm's concept of multiple realities, Bennett did not directly discuss another of Bohm's notions, the 'implicate order'. This concept, according to Beagle, is important because it provides a new insight into theories about libraries and information.[40] Bohm distinguishes between mechanistic order among entities which are outside each other, and the implicate order among living organisms, in which entities constitute an integral part of the whole organism. This emphasizes Bohm's "central underlying theme . . . [of] unbroken wholeness of the totality of existence as an undivided flowing movement without borders."[41]

Beagle illustrated the distinction between mechanistic and implicated orders by comparing it to the distinction between volumes (physical units which are independent of each other) and titles (which are the integral parts of the collection, interrelated by subjects, citations, etc.). Hence, "because one title is represented by many volumes distributed around the world, any library can encompass a very significant portion of the totality of human knowledge."[42]

Beagle concludes by summarizing Bohm's hypothesis that "libraries are not some negentropic aberration from a fundamental law of cosmic disintegration, but rather an expression of an integrative law of underlying order."[43]

8.3.2 According to Howard, the philosophical distinction between an explanation and understanding corresponds to the distinction between the scientific, especially positivistic, and the humanistic, in this case hermeneutic, approach to the theory of understanding. Science argues for neutrality and objectivity, minimizing the role of an individual. The humanities, on the other hand, stress the impact of individuals' purposes and intentions on the way reality is apprehended. Both viewpoints have philosophical merit, and neither should be given a monopoly of interpretation (Howard, 1982).

8.3.3 Hollnagel discusses the psychological issue of 'understanding the understanding' processes. Hermeneutics involves a dialectical procedure of repeated interactions between explanation (analysis) and comprehension (synthesis). In cognitive psychology the focus is not on the process of understanding as a whole, but on the perception of its specific instances, the analysis-by-synthesis. Here the meaning of the message is first guessed, then verified by comparing it with the message's wording.

Hollnagel identified two major differences between the two approaches. (1) The method of validation is determined in the hermeneutical approach by the degree of guessing; in the cognitive paradigm it is determined by the correctness, or the end-result of the understanding. (2) The nature of the processes itself is conscious in the hermeneutical paradigm and unconscious in the cognitive method of understanding. In the main, however, the two methods are more similar than different: "they essentially point to the same phenomenon in different but compatible ways."[44]

## 8.4 Theories about Reality

The major issue in this section is what Nagel describes as

> a single problem: how to combine the perspective of a particular person inside the world with an objective view of that same world, the person and his viewpoint included. It is a problem that faces every creature with the impulse and the capacity to transcend its particular point of view and to conceive of the world as a whole.[45]

Most contemporary interpretations of reality are selective (Rower 1974) and fall within three major approaches, roughly corresponding to the three-dimensionality of procedural, contextual, and conceptual viewpoints, discussed later in this book. (a) In stimulus-response theory, the physical and rational order accounts for patrons' motivations in seeking information. (b) Psychoanalytical theory is based on inner drives, self-gratification, and bibliotheraphy. (c) Cognitive theory offers an explanation of reality by searching for equilibrium between its physical and mental interpretations in terms of the level of individuals' 'cognitive structure,' his or her personal intellectual environment.

Usually, an individual interpretation of reality integrates all three approaches and is based on an 'if-then' proposition. It starts with metaphysical 'if' speculation about reality, which 'then' is verified empirically. The new emerging aspects of that reality are incorporated in the total individual's knowledge; hence understanding of reality is metaphorical.

### 8.4.1 Empirical Stimulus-response Theories

This approach explains human responses to physical stimuli. It is based on British empiricism's notion of mind as a product rather than as the initiator of experience; this view was expanded later by the concept of conditional responses, reinforced by rewards and punishments. Intellectual development is here considered a product of learning, determined by environment and manifested in the behavior of an individual.

The physical dimension of reality is based on the concept of rational order, which explains similarities between past experiences among individuals, later verified by trial-and-error learning processes. This approach does not, however~~,~~ account for variations in the motivation for each individual search for information, thus creating a major problem in information retrieval (Swanson, 1977, 1979, 1986) which has never been completely resolved because it does not satisfactorily account for other dimensions of reality.

This was also a popular premise of the nineteenth century philosophy of librarianship which advocated reading as a device for developing desirable behavior in citizens (Wehmeyer, 1984).

The paradigms of empirical approach include didactic logical method, scientific research focusing primarily on artificial intelligence, and information and expert systems. Its technical processes consist of classification of phenomena and falsification of theories about them. Popper's law of falsification (or refutation), expresses the preference in science for a proof of that which is false, rather than that which is true, or that which is bad rather than that which is good in moral philosophy (Popper, 1979). It is easier to find faults in a theory than to be sure of its absolute nonrefutable status. The theoreticians of this approach follow directly or indirectly Comte's anti-metaphysical philosophy of positivism; they include Shannon, Bradford, Harlow, and Saracevic. The models representing this approach in LIS include bibliometrics and operational research, developed by documentalists and information scientists.

Library procedural approach resembles the empirical philosophical viewpoint. It focuses on sense experienced reality of librarianship, and thus it describes the epistemological nature of the discipline.

### 8.4.2 Motivational Psycho-analytical Theories

This philosophy emphasizes inner drives that influence individuals' reactions to the stimuli. It points to a struggle within each individual between the pressures of physiological stimulations and psychological, intellectually motivated responses. Here reality is perceived in terms of an individual need for self-gratification, which influences learning processes. Thus, for example, the premise of bibliotheraphy is based on the notion that the identification of one's own problems with those of others improves self-understanding (Wehmeyer, 1984).

The psycho-analytical, socio-cultural approach expands the environment of the discipline, by incorporating both the internal (within) and the external (outside of the discipline) stimuli. The discourse concentrates on what is now and what ought to be in the future. It focuses on needs for information and its content on information-related processes and communication, as well as on ethical and aesthetic issues affecting library operations.

The theories and models of this approach, interpreted as contextualism in my model, reflect a humanistic orientation, stressing the importance of reading and book selection, and include Butler's culturalism, Shera's social epistemology (1964), and Taylor's value-added model (Taylor, 1986).

### 8.4.3 Rational, Cognitive Theories

This approach is based on an intellectual and deductive (i.e., rational) assertive explanation (i.e., cognitive) of reality. The approach assumes that individuals act rationally, and that thinking is the key element in understanding reality, by searching for underlying assumptions that assert, deny, or question different interpretations of reality.

The approach, called conceptualism in my model, aims at explanations of relations between stimuli and responses to them. It is a logical view, considering recorded thoughts as a key element in understanding the reality of librarianship. It describes the metaphysical meaning or essence of librarianship as a facilitation of a continuous dissemination of knowledge about reality.

The focus of this approach is on the purposes. the missions, and the interdisciplinary and metascientific character of the discipline. Writers reflecting this viewpoint include Kaplan, Shera, Wright, and the present author, all aiming at the development of a unified theory of librarianship. Crucial here is the way one perceives different aspects of reality in the context of its total 'cognitive structure.' Piaget defines the cognitive structure in terms of a search for an equilibrium between the old and new perceptions of reality. Intellectual development itself is a process of restructuring one's knowledge of the world by a series of changes in one's cognitive structure.

### 8.4.4 Continuity Principle

I suggest that a unifying principle in all interpretations of reality is the continuity of human effort to understand it. The motives for this persistent search may be a desire to remove uncertainty created by gaps in our knowledge of reality, or a need to be assured or reassured that our understanding is valid.

The continuity of human constant need for knowledge becomes a substance of metalibrarianship.[46] Human's conscious life is a constant search for answers to the unknown, the need for more data, information, or knowledge about themselves and their environment. This need resembles Johnson's 'continuant,' the substance, which is constant while its states or relations may be changing.[47] The continuants referred to both physical and psychological aspects of reality, linked together by "causal unity of connection . . . between [their] temporarily or specially separated manifestations."[48] That is, reality is not interpreted exclusively as a physical or mental phenomenon, but as a relationship between the two.

### 8.4.5 Individual Interpretations of Reality

The individual's interpretation of reality consists of several distinct steps. A starting point is a broad, informal, metaphysical speculation. An individual works with some intuitive hints about the relations, questioning existing knowledge about a particular issue. The speculation is then restated in broad, known physical principles, statements, or hypotheses as they relate to some observable facts. The restatements are then: (a) verified or refuted, and if accepted, formalized in physical, empirically tested terms of existing theories, (b) further expanded by anticipated new social needs and identification of some possible future consequences of the emerging theory, and (c) incorporated into an individual's broader understanding, the metaphysical knowledge of reality.

The new formulation of reality is now expanded by identifying metaphysical consequences within the parameters of the theory. Newly acquired understanding is critically evaluated, questioning the anticipated state of understanding. And finally, the fully integrated interpretation of reality becomes the first level of metatheory.

The process is repeated, sharpening at each repetition the metatheoretical formulation of the discipline. Repetitive cycles gradually improve the specificity of the metatheory.

## 8.5 LIS Theories of Recorded Knowledge

### 8.5.1 Definitions

To illustrate the variety of model building in Library Information Science, I selected from the library literature three hypothetical approaches to the definition of knowledge as they relate to librarianship, by abstracting from the works of: (a) Kemp's essay on recorded knowledge in library collections, (b) McGarry's sociological and behavioral interpretation of relationships among communication, knowledge, and libraries, and (c) Machlup's discussion of the production of knowledge as an economic process.

8.5.1 Kemp (1976) in his introductory work on the nature and properties of knowledge and its relationships to librarianship and communication, provides a working definition of 'knowledge'. It is an expression of belief, either as a personal, individual, apperceptive knowledge, or as social, collective knowledge that is contained, for example, in library documents. The two are interdependent: "Social knowledge depends for its existence on personal knowledge; much personal knowledge is derived from social knowledge."[49]

A knowledge statement must be compatible with other statements considered to be true, although none expresses absolute knowledge. Knowledge "is different at different times and in different environments."[50] The essential property of knowledge is its organization into a coherent, and social acceptable, whole system.

The function of libraries is to facilitate the communication of social knowledge through acquisition, preservation, organization, and dissemination of recorded knowledge.

8.5.1.2 McGarry (1975) reviews the relationships among knowledge, communication, and libraries as a synthesis for a foundation of librarianship.

Knowledge is a system of symbolic descriptions of reality which, in turn, is defined as "a social construct, created by the collective perceptions of social man . . . man is . . . a product of his culture and his perceptions are conditioned by a common world picture built up by his ancestors."[51]

Communication is a mechanism for the transfer of information or knowledge; information refers to "disconnected facts or events or 'patterns of stimuli' and confines the term knowledge to a systematic and ordered system."[52]

In this approach librarian is assigned "a new social role as 'linkman'; the man with the overview, whose particular expertise is a kind of 'knowledge about knowledge'; who realizes the degree to which the major disciplines of knowledge fragment and overlap each other."[53] In his later work McGarry interrelates knowledge with information and language: "both knowledge and information are embodied in language and both involve a conceptual apparatus that is not derived from the data we receive from the phenomenal world but imposed upon them."[54]

8.5.1.3 In the words of one of his reviewers, Machlup's essays represent "a great garden - Machlup's Garden of Knowledge."[55]

In it, he identifies many definitions of knowledge analyzed as an economic activity in the processes of inquiring into knowledge production. I selected here the discussion of definitions related to types, qualities, and products of knowledge.

Machlup identifies five classes of knowledge: (1) practical e.g., professional or political; (2) intellectual, satisfying cultural curiosity; (3) pastime, recreational knowledge;

(4) spiritual, religious knowledge; and (5) unwanted knowledge, accidentally acquired and of no immediate interest.[56]

Qualities of knowledge include the concepts of truth (or belief), beauty, and goodness. Philosophical questioning "whether knowledge is a particular kind of belief, whether belief is a particular kind of knowledge, or whether knowledge and belief are different things . . . can be . . . simply interpreted as a fusion of the two meanings of the term's knowledge: the known and the knowing."[57]

The aesthetic notion of knowledge refers either to the object of knowledge, itself beautiful (e.g., a plot of a poem), or the form in which knowledge is conveyed. Machlup illustrates this notion by citing examples from art and science (e.g., a scientific proposition may be elegant, but its formulation awkward).[58]

He rejects the notion of 'goodness' in ethical knowledge. It may be interpreted empirically as true or false, but "neither ethical knowledge nor knowledge of ethics (the science of ethics) can be judged to be good or wicked."[59]

Knowledge as a product is determined by economic considerations of the consumer's choice, entrepreneurial initiative, and political decisions.

The market mechanism determines only a part of knowledge production (e.g., in book sales and information services); most knowledge is available free. However, many business decisions depend on both the supply and demand for information.

Although research is often privately initiated, it is frequently supported by government grants or direct involvement in research and development.[60]

And finally, "knowledge production can mean producing additional new ideas -- extending the universe of the known -- but also producing a state of knowing in additional minds -- extending the population of knowers."[61] Library Information Science assists in the former and is responsible for the latter aspects of knowledge production.

### 8.5.2 Models

The models of knowledge discussed in this section are again arbitrarily extracted from the works of Shera, Wilson, and Dretske, none necessarily reflecting the main thrust of their essays.

8.5.2.1 Shera acknowledged that the model of social epistemology, introduced by him and Egan, was an extension of Butler's argument for an epistemological base of librarianship. Butler maintained that knowledge about knowledge is basic to librarianship, as expressed in his concept of 'history of scholarship.' Shera agrees.

In order to fulfill library responsibility for the dissemination of knowledge, Shera claims that two questions must be answered first: "What is knowledge; or more specifically, what are the characteristics of recorded knowledge? and How it is put to work?"[62] In defining knowledge, Shera follows Boulding's distinction between information and knowledge: "information is the input of knowledge . . . knowledge is everything an organism has learned or assimilated -- values as well as facts or information -- organized according to whatever concepts, images, or relations it has been able to master."[63]

Knowledge is disseminated through communication, with the library performing an important role in the communication network. [64] This role is not only to provide a link in a system but also to transmit knowledge.[65] In the past, the epistemological studies of the nature of knowledge were individual-oriented. They bypassed the differentiation and integration of knowledge within society.

To remedy the omission, Shera and Egan proposed social epistemology, or social cognition, as a framework for analyzing intellectual processes in the society. They defined it as "a study of the ways in which society as a whole achieves a perceptive relation to its total environment . . . [with the focus] upon the production, flow, integration, and consumption of all forms of communicated thought throughout the social fabric."[66]

Shera considered this new approach essential in the theory of librarianship since it clarifies the role of library in the dissemination of society's records. As the management component of knowledge, librarianship's goal is "to maximize the social utility of graphic records."[67] This can be accomplished only if the librarians understand the role of knowledge in the society.[68]

8.5.2.2 Patrick Wilson extended Shera's concept of social epistemology to the study of bibliography and the issue of cognitive authority.[69]

He first makes a distinction between firsthand knowledge based on direct, personal experiences, and secondhand knowledge obtained from other people's experiences. The purpose of Wilson study is to "explore not what is known about the world, but rather what people think about knowledge -- how they decide who knows what about what. This is a question about cognitive authority."[70]

Cognitive or epistemic authority is described by Wlson as a kind of influence a person has on another in terms of his or her recognized expertise. The authority is relative to a specific field of interest. It involves credibility, based on competence and trustworthiness, and it is consciously recognized as proper by the person accepting the authority of another. Cognitive authority applies to any sphere of knowledge or opinion, not imposing on others what to think, but suggesting, or advising, on issues they are competent in.[71]

Wilson restates the above definition in an abstract form: "Person A is a cognitive authority for person B with respect to sphere of interest S to the degree that what A says about questions falling within the sphere S carries weight for B."[72]

The cognitive authority of a librarian is to make a judgment about cognitive authority of authors and their published work. "Librarians cannot simultaneously deny competence to judge the quality of texts and assert competence to answer questions by finding the answers in books. Library reference service appears to be based on a contradiction: the simultaneous assertion and denial of competence to evaluate texts."[73]

This contradiction is a core of contention in the discussions of librarians' neutrality. Wilson makes a distinction between the position of a librarian (a) in a didactic library, in which the content of book collection is predetermined by the official policy, e.g., in the case of religious or specialized governmental libraries, and (b) in a liberal library which aims at a collection that includes all opinions. In the former case the librarian cannot be neutral; he or she must either have, or pretend to have, an opinion on the subjects represented in the collection. In the latter case, the librarian must be neutral, by not influencing the patron in any way. "The contrast between didactic and liberal could hardly be more extreme. In the one, cognitive authority is the dominant consideration; in the other, consumer demand is the dominant consideration."[74]

Wilson recommends, as a way out of the dilemma, a skeptical "attitude of one who neither asserted nor denied the possibility of knowledge, but continued to inquire, though always unsatisfied that knowledge had yet been found."[75]

8.5.2.3 Dretske (1981) took a diametrically opposite view, based on the materialistic metaphysical position that knowledge is absolute and identified with information-caused belief, rather than with traditional epistemological notion of knowledge as a 'form of justified true belief.' Dretske defines perceptual knowledge in terms of information and its component, belief; "we already understand what knowledge is in its use of the concept information."[76]

He dissociates the concept of information from that of meaning, considering communication as a process of providing information, not meaning. "There is no reason to think that every meaningful sign must carry information or, if it does, that the information it carries must be identical to its meaning." [77] Although normal exchange of information involves the use of meaningful signs, the meaning of these symbols is not a synonym with the information they carry.

He defined informational content as follows:

> A signal r carries the information that s is F = The conditional probability of s's being F, given r (and k), is 1 (but, given k alone, less than 1)
>
> Where k "stands for what the receiver already knows (if any thing) about the possibilities that exist at the source.[78]

Dretske illustrates the dependence of knowledge on available information by describing the lottery paradox: the chances of winning by someone are 100%, but almost none for a particular individual participating in the lottery. Yet no one knows whether he or she will loose, although somebody will win.[79]

That is, assuming that the signal r (e.g., an advertisement of the lottery) says that 'someone will win the lottery' (i.e., 's is F'), then the probability that I may win that ticket (i.e., I am 's') cannot be high unless I know something about the way the lottery operates in selecting my ticket, which of course, is not the case in an honestly run lottery system.

The point made is that "we must accept the view (built into our characterization of knowledge) that the knowledge that s is F requires (because it is required as a cause of belief) the information that s is F."[80]

Dretske also discusses another distinction between perceptual and cognitive knowledge that is relevant to our study. Perceptual knowledge refers to the sensory experience of, e.g., "seeing x'. Cognitive knowledge stands for the recognition of things seen as x. Perceptual knowledge is a cognitively neutral experience of 'seeing'. Cognitive knowledge implies a belief, an internal state of mind, affecting the way, e.g., we see x. [81]

All signals contain information in both forms. The information is carried in digital form if a signal carries only the information that is already contained in 's is F.' If the signal carries additional information about the statement, 's is F,' then that information is carried in analog form.[82]

Specific information is extracted from the analog form by the analog-to-digital conversion. The information in analog form that is irrelevant to a particular search is excluded, and thus lost, thus reducing its informational content. The process allows for classification, generalization, and recognition of a specific input as a part of a more inclusive category.[83]

"To summarize . . . our perceptual experience . . . is being identified with an information-carrying structure -- a structure in which information about a source is coded in analog form and made available to something like a digital converter . . . for cognitive utilization."[84]

### 8.5.3 Limitations in Structuring Knowledge

In this section I focus on two kinds of limitations: (a) between human memory and the organization of knowledge discussed by Harmon (1973), and (b) limitations created by theoretical, deductive, and empirical, inductive, components of a discipline, reviewed by Storer and Parsons (1968).

8.5.3.1 Harmon is interested in "the extent to which fields of recorded knowledge, particularly information science, have been formed, structured, and circumscribed in accordance with the necessities and constraints imposed by a relatively constant and limited span of human memory."[85]

Limited human memory lead to the use of records; the increased number of records, in turn, initiates specialization and subsequent fragmentation of knowledge into different subsystems, systems, and interdisciplinary systems of knowledge.

A subsystem is defined by Harmon as a component of a larger system. It is based on a synthesis of prior contributions. Euclidean geometry, calculus, and universal gravitation are the examples of such subsystems.

System is a culmination of a number of relevant subsystems organized for cognitive manageability, such as physics and chemistry. The resulting disciplinary limitations of scope and depth are minimized by integrative interdisciplinary movement between the disciplines, especially between communication and behavioral sciences.

Suprasystem combines several systems into a comprehensive and encyclopedic system of knowledge. Presently four such suprasystems are identified: humanities, physical, biological, and social sciences; and according to Harmon, a fifth suprasystem, information science, is now emerging.

Harmon proposes some hypotheses about the manner in which the changing structure of knowledge takes place.
(1) Scientists synthesize their findings into cognitive, restricted configurations, thus making information-processing easier. (2) The smaller systems, through synthesis, merge into larger systems of knowledge. (3) The merge is done within the limits of short-term memory of the scientists. (4) The process of

synthesizing can be done simultaneously by different scientists, thus accounting for simultaneous discoveries. (5) The "basic pattern underlying the formation of systematic knowledge is one of synthesis . . . larger supradisciplinary organizations of knowledge will tend to consist of approximately seven systems."[86]

The overriding hypothesis is the notion that the limitations of human memory are major factor in specialization and differentiation among departments of knowledge, resulting in development of a classificatory structure based on a progressive "encyclopedic reduction, synthesis, and systematization of knowledge.[87] A chronological review of the development of different fields of knowledge confirms the above hypotheses.

Harmon suggests that information science may become a major suprasystem. "A potential long-range role for information science involves active participation in forming a complete suprasystem of knowledge that could unify the arts, sciences, and professions . . . [it could] strive to overcome the limitations of human memory and thereby increase the scope of human comprehension." [88]

8.5.3.2 Storer's and Parsons' essay (1968) provides an analysis of factors responsible for the differentiation between academic disciplines by focusing on the academic profession. The authors define the academic profession in terms of its "responsibility for the maintenance, transmission, and employment of a specialized body of knowledge, and often for its extension in both empirical and theoretical directions."[89]

Internal differentiation among academic professions is reflected in the division of knowledge into separate disciplines. For reasons of professional autonomy, the tendency is to emphasize the differences rather than similarities between these subdivisions.

The differentiation of knowledge into disciplines is discussed in terms of the validity of disciplinary separateness in making significant contributions to knowledge.

The validity test for natural sciences is in their ability to provide logical predictions based on empirical data, and in relative independence from cultural factors. In humanities, the contributions are mainly in the area of 'cultural products' such as books or works of art, analyzed in the context of established values and meaning. Social sciences combine empirical validity in assessing sociological data and humanistic, socially determined standards.

The significance of contributions made by each discipline is determined by the intrinsic phenomena studied. Natural sciences, through a series of reductionism and antireductionisms, established open systems of generalizations and integration, which provides for the emergence of new phenomena with mathematical precision. In the humanities, focusing on the meaning rather than on description of phenomena, the significance of their contribution is limited by a conflict between the social acceptance and scientific precision of their pursuit of knowledge. Social sciences again share the advantages and disadvantages of the previous two disciplines. Because of the lack of a satisfactory 'grand theory,' there is a considerable struggle between the subdivisions within social sciences, with a tendency to break away rather than to unify.

Important empirical factors affecting differentiation among the disciplines are monographic publications, accessible through libraries, and professional journals. Both perform "the essential function of making available to scholars materials relevant to their interest of which they were previously unaware or which are new and could not have been known before." [90] Usually scholars subscribe to the journals in their field, and use the library 'on demand' only. The importance of journals varies with the discipline; their rate of growth, scope, and cost to individual scientists creates a problem of access to information. An increased quantity of recorded information limits the discipline's theoretical ability to integrate and results in a steady-state in each discipline "where the quantity of material added to the literature is limited by a discipline's ability to organize this information. As organizational or integrative ability increases, the output of information facilitated by it also increases, so that the degree of 'strain' may remain relatively constant."[91]

The authors express a hope that closer future cooperation between academic theorists and information specialists may contribute to a better organization of knowledge and access to it.

### 8.5.4 Cognitive models.

I conclude this chapter with a brief review of the most recent research interests, especially among the information scientists, to relate the concept of perception of reality to the psychological notion of cognition.

Cognition, a concept of particular interest to contemporary information scientists, is a generic term for all processes involved in knowing. It is triggered by the interest in the perception of an external world, and it is extended to the analyses of relations in terms of more specific metaphorical categories. Cognition differs from knowledge by being limited to perceptive experiences, while knowledge is the relations discovered in cognitive and other processes. Perceptions are specific experiences of external objects based on sensory stimulation. Metaphorically speaking, they reflect what we see.[92]

The categories are more complex, imperfect reflections of reality. Perception relates to existing information, and categorizations extend information to the beliefs about the perceived reality. This is well expressed by an old proverb, that 'seeing and thinking' are not synonymous experiences. However, the two experiences are intertwined; at basic levels of analysis we see directly which are the things analyzed and what are the theories about them. [93] Thus the importance of theories in categorization, called by Lakoff 'idealized cognitive models,' is established.

"Our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature."[94] Accordingly, "the essence of metaphor is understanding and experiencing one kind of thing in terms of another."[95] The cognitive aspects of a metaphor relate to the ways knowledge is acquired, interpreted, and communicated. Therefore, the metaphor is a transfer of meaning. Of interest to information and library scientists is the way that meaning is transferred from the originator of the message or its carrier to the receiver.

The recent work in cognitive communication and psychology begun with the study of concept formation processes in the 1960s and 70s. In 1973, Rosch redirected the research by focusing on an ecological approach of linguistic and cultural categories used in everyday situations. A distinction was made between a given category, called by Rosch a 'prototype,' and other, derivative 'across categories.'

Categories are defined in relation to specific models, in which perceptual similarity between them plays a critical role in the process of categorization. Neisser distinguishes between (a) processes by which individual objects are categorized, (b) the gradients of 'typicality' that appears in the category structures, and (c) the meaning of the category itself.[96] "To categorize is to treat a set of things as somehow equivalent: to put them in the same pile, or call them by the same name, or respond to them in the same way."[97] "To categorize an object . . . is to assert that it bears a particular relation to a particular set of ideas."[98]

As Beardsley pointed out,[99] theories of metaphor address two basic issues: (a) the tension created by the implied meaning in the metaphor, and (b) the intelligibility of the meaning contained in it. The Emotive theory considers metaphors unverifiable, and hence meaningless. The Comparison theory, on the other hand, considers them as meaningful, explaining the tension within metaphors by the remoteness of the relationships suggested by them, or in terms of the degree of the metaphoric relation itself. The Iconic Signification theory extends that analogy by pointing out to the similarity between the iconic representation of the meaning that the metaphor stands for and the actual meaning that it signifies. The Verbal-Opposition theory interprets metaphor in terms of two levels of meaning: the central (literary, dictionary) and marginal (suggestive) meanings (Beardsley, 1967).

McCauley defined a classical theory of the category by stating that "something is a member of a particular category because it satisfies the set of necessary and sufficient conditions which constitute the category's defining properties, and any particular thing either has or has not these characteristics."[100]

Neisser distinguishes between functional, perceptive categories based on interchangeability, and thematic, narrative categories based on common membership. In the former, different categories play similar roles; in the latter, different objects play a part in a combined activity.

To summarize, cognitive processes consist of three basic components: the perception itself, its analogical reasoning, and the categorizations of the results of the analyzes. Analogical reasoning is metaphorical, distinguishing among similarities, differences, and identities in perceptive processes. The categorization may be functional, thematic, or relational.

In the late 1970s I related metaphors to library models, by making a distinction between three kinds of metaphorical categorizations. The functional categories are based on procedural, empirical perceptions while the thematic, contextual categories are based on culturally influenced conventions. I added a third, relational, conceptual category, based on similarities and differences between various perceptions. The 'difference' is not merely an opposite of 'similarity'; each category manifests some unique perceptive characteristics of its own (Nitecki, 1979).

Since then, a number of more detailed theories were proposed. Taylor's 'user-driven model,' focused on the environment of the users of information, distinguishing it from the content and technology-driven models (Taylor, 1986). Dervin emphasized a qualitative approach in her 'sense-making theory,' in which the individual searches for missing information, evaluated in terms of the information-seeker's objectives (Dervin, 1992). Schön (1979) based his analyses of social-policy development on the metaphorical description of the social setting made by people perceiving the problems. Reddy's 'conduit-metaphor' explained how we interpret ideas communicated to us by others. Based on the proposition that "no one receives anyone else's thoughts directly in their minds," the conduit metaphor precedes a framework, within which "the listener's task must be one of extraction. He must find the meaning 'in the words' and take it out of them, so that it gets 'into his head.'" [101]

Recently, several studies by information scientists were focused on the application of the metaphorical theories to information and library practice. Green's application of the conduit metaphor to an analysis of the use of the word 'information' demonstrated the significance of the linguistic predisposition in defining library concepts such as, e.g., information retrieval.[102] Carbonell's model of 'invariance hierarchy' pointed out the invariable, constant hierarchy of relationships between the source of the metaphor (i.e., its metaphorical meaning) and its target. The stronger the variance, the more convincing the metaphor.[103]

And finally, D. Nitecki utilized all the above metaphorical concepts in designing a study for analyzing the view of the library among university faculty, administrators, and librarians. Using a qualitative method, she identified a number of metaphors describing the similarities and differences in conceptual perception of the roles and functions of a library by different members of the university community. Here, "metaphors serve not only a role in tracking what is said about libraries, but also serve as a vehicle to describe what may be unknown, confusing, and perhaps even elusive concepts of the future libraries."[104]

## NOTES

1. Shaughnessy, T. W. (April 1976). "Theory Building in Librarianship." *The Journal of Library History*, 11, p. 174.

2. Ibid., pp. 168-169.

3. Boyce, B. R., and Donald H. Kraft. (1985). "Principles and Theories in Information Science." *Annual Review of Information Science and Technology*, 20, p. 165.

4. Popper, K. (1963). *Conjectures and Refutations: The Growth of Scientific Knowledge*: Harper, p. 241.

5. Bierbaum, E. G. (January 1990). "A Paradigm for the '90s." *American Libraries*, 21(1), p. 18.

6. Ibid., p. 19.

7. Bookstein, A. (Summer/Fall 1979). "Explanations of the Bibliometric Laws." *Collection Management*, 3(2/3), p. 151.

8. Hesse, M. (1967). "Models and Analogy in Science." In Paul Edwards (ed.), *The Encyclopedia of Philosophy*, 5. New York: Macmillan Publishing Co., pp. 354-359.

9. Ibid., p. 358.

10. Wilson, I.G., and M.E. Wilson (1963). *Information, Computers, and System Design*. New York: John Wiley, p. 3.

11. Klir, George J. (1969). *An Approach to General Systems Theory*. Van Nostrand Reinhold Co., p. 268.

12. Hall, A. D., and R. E. Fagen. (1956). "Definition of a System."*General Systems Yearbook of Society for the Advancement of General Systems Theory*, 1, p. 18.

13 Mortazavian, H. (1983). On System Theory and Its Relevance to Problems in Information Science. Op. cit., p. 582.

14. Langlois, R. N. (1983). "Systems Theory, Knowledge, and Social Sciences." In F. Machlup, & Mansfield Una (editors), *The Study of Information*; *Interdisciplinary Messages*. New York:John Wiley, p. 582.

15. Ibid., p. 583.

16. Ibid., p. 588.

17. Bertalanffy, L. von (1950). "An Outline of General System Theory." *British Journal for the Philosophy of Science*, p. 138.

18. Ibid., p. 139.

19. Laszlo, Ervin (1975). "The Meaning and Significance of General System Theory." *Behavioral Science*, 20, p. 20.

20. Ibid., pp. 22-23.

21. Bahm, A. J. (September 1973). "General Systems as Philosophy." *General Systems Bulletin*, 4(2), pp. 5-6.

22. Foskett, D. J. (July, 1972). "Information and General System Theory. Review." *Journal of Librarianship*, 4(1), p. 206.

23. Foskett, D. J. (1974). "General Systems Theory and the Organization of Libraries." In G. Holroyd (editor), *Studies in Library Management*. London: Clive Bingley, p. 11.

24. Foskett, 1972, op. cit., p. 208.

25. McMahon, A. M., and Tydeman, J. (1977). "A System Framework for Library Analysis." in G. J. Klir (editor), *Applied General Systems Research: Recent Developments and Trends.* New York: Plenum Press, p. 905.

26. Bellomy, F. L. (October 1968). "The Systems Approach Solves Library Problems." *ALA Bulletin*, 62(9), pp. 1122-23.

27. Foskett, D. J. (1974). "General Systems Theory and the Organization of Libraries." In G. Holroyd (editor), op. cit., p. 17.

28. Bryson, E. R. (1970). *A Theory of Librarianship.* Unpublished doctoral dissertation, University of Kentucky, Lexington, Kentucky, pp. 14-15.

29. Ibid., pp. 80-81.

30. Bennett, G. E. (1988). *Librarians in Search of Science and Identity: The Elusive Profession.* Metuchen, N.J.: Scarecrow Press, p. 8.

31. Bohm, D. (1957). *Causality and Chance in Modern Physics.* London: Routledge & Kegan Paul, pp. 169-179.

32. Ibid., pp. 169-170.

33. Bennet, 1988, op. cit., p. 6.

34. Ibid., pp. 20-21.

35. Bennett identified three traditional definitions of hermeneutics: as rules for the interpretation of classical literature, as critical explanation of scripture, and as the law. He adopted Ricoeur's definition but did not define it in the essay itself (Ricoeur, P. 1981). *Hermeneutics and the Human Sciences*; *Essays on Language, Action and Interpretation*. Cambridge: Cambridge University Press.

36. Bennet, 1988, op. cit., p. 40.

37. Menzel, J. P. (1972). *Arthur Owen Barfield: An Appraisal of His Contribution to Epistemological Studies*. Unpublished doctoral dissertation, Long Island University, p. 22.

38. Ibid., p. 26.

39. Ibid., p. 43.

40. Beagle, D. (March 1988). "Libraries and the 'Implicate Order': A Contextual Approach to Theory." *Libri*, 38(1), p. 30.

41. Bohm, D. (1980). *Wholeness and the Implicate Order*. London: Ark Paperbacks, p. 172.

42. Beagale, 1988, op. cit., p. 34.

43. Ibid., p. 43.

44. Hollnagel, E. (1978). "The Paradigm for Understanding in Hermeneutics and Cognition." *Phenomenological Psychology*, 9(1), p. 216.

45. Nagel, T. (1986). *The View from Nowhere*. New York: Oxford University Press, p. 3.

46. The concept of continuity and the importance of the continuum in metalibrarianship is discussed in more detail in Chapter Ten.

47. Johnson, W. E. (I, 1921; III, 1924). *Logic*. Cambridge, v.1., p. 199.

48. Ibid., v. 2, p. 99.

49. Kemp, D. A. (1976). *The Nature of Knowledge; An Introduction for Librarians.* London: Clive Bingley, p. 162.

50. Ibid., p. 163.

51. McGarry, K. J. (1975). *Communication, Knowledge, and the Librarian.* London: Clivbe Bingley, p. 41.

52. Ibid., p. 34.

53. Ibid., p. 48.

54. McGarry, K. J. (1981). *The Changing Context of Information; An Introductory Analysis.* London: Clive Bingley, p. 35.

55. Galambos quoted by D. W. King (February 1983). "Professor Fritz Machlup, 1903-1983." *Bulletin of the American Society for Information Science*, 9(3), p. 29.

56. Machlup, F. (1980). *Knowledge: Its Creation, Distribution, and Economic Significance.* Princeton, N.J.: Princeton University Press. Vol. 1, Knowledge and Knowledge Production, p. 108.

57. Ibid., pp. 113-114.

58. Ibid., p. 122.

59. Ibid., p. 123.

60. Ibid., p. 155, passim.

61. Ibid., p. 186.

62 Shera, Jesse H. (1965). *Libraries and the Organization of Knowledge*. Hamden, Conn.: Archon Books. (With a few modifications of the original text made by the editor), p. 176.

63. Shera, J. H. (1972). *The Foundations of Education for Librarianship*. New York: John Wiley (A Wiley-Becker and Hayes publication), p. 117 (with a footnote to Miller and others, *Plans and the Structure of Behavior*, New York, Holt, 1960, p. 18).

64. Shera, Jesse H. (1976). *Introduction to Library Science: Basic Elements of Library Service*. Littleton, Colorado. Libraries Unlimited, Inc., p. 46.

65. Shera, 1972, op. cit., p. 110.

66. Ibid., p. 112.

67. Shera, 1965, op. cit., p. 16.

68. The citations to Shera's viewpoints are intentionally spread throughout several publications, since the same concepts are repeated and often reprinted in different sources.

69. Wilson, P. (1983). *Second-Hand Knowledge; An Inquiry into Cognitive Authority*. Westport, Conn.: Greenwood Press (Contributions in Librarianship and Information Science, Number 44), p. vii.

70. Ibid., p. 10.

71. Ibid., pp. 13-20.

72. Ibid., p. 13.

73. Ibid., p. 183.

74. Ibid., p. 191.

75. Ibid., p. 194, also footnoting Naess, 1968, and Sextus Empiricus, 1935).

76. Dretske, F. I. (1981). *Knowledge & the Flow of Information.* Cambridge, Mass.: The MIT Press (First MIT Press paperback edition 1983), p. 86.

77. Ibid., p. 42.

78. Ibid., p. 65.

79. Ibid., p. 99, passim.

80. Ibid., p.105.

81. The above explanation is highly selected and abbreviated, not reflecting of Dretske's very detailed discourse on the issue.

82. Dretske, 1981, op. cit., p. 137.

83. Ibid., p. 141.

84. Ibid., p. 153.

85. Harmon, G. (1973). *Human Memory and Knowledge; A System Approach*. Westport, Conn.: Greenwood Press, p. 3.

86. Ibid., p. 13.

87. Ibid., p. 79.

88. Ibid., p. 110.

89. Storer, N. and Parsons, Talcott (1968). "The Disciplines as a Differentiating Force." In E. B. Montgomery (editor), *The Foundations of Access to Knowledge.* Syracuse, N.Y.: The School of Library Science, p. 101.

90. Ibid. p. 118.

91. Ibid., p. 119.

92. Perceptions have been interpreted by Bacon as the mind's adaptation to external influences, by Descartes and Spinoza as an intellectual rather than sensual apprehension, and by Leibniz as the cognizance of a monad (a metaphysical self) about the existence of other monads.

93. Neisser, Ulrich (1987) (ed.), *Concepts and Conceptual* Development: *Ecological and Intellectual Factors in Categorization.* Cambridge and New York, Cambridge University Press, p. 4.

94. Lakoff, G. and Mark Johnson (1980). *Metaphors We Live By.* Chicago: The University of Chicago Press, p. 3.

95. Ibid., p. 5.

96. Neisser, 1987, op. cit., p. vii.

97. Ibid., p. 1.

98. Ibid., p. 4.

99. Beardsley, M. C. (1967). "Metaphor." In P. Edwards (ed.), *The Encyclopedia of Philosophy.* v.5, pp. 284-289. New York: Macmillan Publishing Co., p. 205, passim.

100. McCauley, R. "The Role of Theories in a Theory of Concepts." In: U. Neisser, 1987, op. cit., pp. 228-309.

101. Reddy, M. J. (1979). "The Conduit Metaphor -- A Case of Frame Conflict." In Andrew Ortony (ed.), *Metaphor and Thought.* Cambridge: Cambridge University Press, pp. 286, 288.

102. Green, R. (June 1991). The Profession's Models of Information: A Cognitive Linguistic Analysis. *Journal of Documentation,* 47(2), pp. 130-148.

103.Carbonell, J. G. (1982). "Metaphor: An inescapable phenomenon in natural language comprehension." In W. A. Ringle Lehnert (eds.), *Strategies for Natural Language Processing*. Hillsdale, NJ: Erlbaum, pp. 415-434.

104.Nitecki, Danuta A. (1993) "Conceptual Models." (Unpublished manuscript accepted for publication in Journal of Documentation, p. 25.)

# PART III:
# METALIBRARIANSHIP

The focus of metalibrarianship is on the unique information needs of a patron for the records that may or may not contain needed data, and on the constantly changing environment that influences the process, the context, and the meaning of information transfer.[1]

## CHAPTER 9:
## Intellectual Environment of Metalibrarianship

### 9.1 The concept of Intellectual Environment (IE)

### 9.1.1 Introduction

Traditionally, discussions of intellectual environment in librarianship focus on the reading activities and the availability of reading materials in the library, stressing their nonmanual, mental dimension. This viewpoint is inherited from the times when librarians struggled for a professional self-identity, by combating a stereotype of a librarian presented as a glorified clerk, dedicated only to the physical processing of books, and encouraging their reading in a perfectly quiet library.

The interpretation of intellectual environment in this chapter relates to a different aspect of the discipline. The library created by its society is responsible not for influencing the changes in the individual environments of its patrons, but for providing and protecting the intellectual environment itself. By facilitating access to records and the use of them, the library leaves it to the individual patron to determine how to use the available resources. Library always serves the needs of every individual who asks for the service by responding to his or her intellectual demands for information. Both the types of needs and the kinds of information vary considerably. Common in all libraries is a function of facilitating the transfer of the content of recorded messages 'as is' to individual patrons. The uniform responsibility shared by all libraries is a creation and preservation of a proper environment, necessary for such a transfer. This approach requires better understanding of the cultural and behavioral needs of library patrons. The library interior arrangement, for example, should be based on the psychological needs of its clientele, and the librarians should be socially and politically sensitive to users' attitudes (Bergen, 1963).

Thus the major objective of intellectual environment is a provision of opportunities for understanding the reality. Since our knowledge will never be complete, the way we interpret knowledge is the key to our understanding of this environment. The distinction between reality and its appearance is a perennial issue of philosophy.

The model of intellectual environment in librarianship proposed in this book attempts to interrelate major views of perceiving the world. There is no one exclusive way of interpreting reality, whether using the philosophical, scientific, or pragmatic method of investigation. Hence, there is no one correct viewpoint, no one theory or hypothesis that covers all aspects of our knowledge. Clearly, the librarian must recognize and respect the individual patron's motivation in searching for a particular kind of knowledge. Hence, the major mission of librarianship is to provide an intellectual environment that would create the opportunity for any patron to explore library collection of recorded knowledge to satisfy his or her own needs.

### 9.1.2 Contemporary Anti-intellectualism

The current library intellectual environment is passive; it offers users an opportunity to expand their intellectual curiosity, but it does not directly assist them in this process. To change the present attitude, librarians must change their philosophical orientation by expanding their purely pragmatic preoccupation with the process of acquiring and disseminating the information. To do this, they need a much better understanding of the individual patron's motivation in using the available information, and they also need to develop a world viewpoint that integrates a variety of different, individual interpretations of reality. Librarians must combine bibliographic expertise with psychological mastery of mediation and consultation. This is why John Dewey, a true pragmatist, encouraged an intellectual approach to life, arguing for (1) a liberalization of practitioners by enlarging their horizons, and for (2) bringing the intellectuals down to earth by applying their philosophies toward practical ends (Dewey, 1933). In effect, he argued against the prevailing anti-intellectualism in our materialistic society.

Stieg (1992), in her argument for a need for a knowledge base in librarianship, pointed out some theoreticians for whom "knowledge is less a matter of skill, facts, or learning than it is of understanding . . . . For them, attitude [to serve] overrides cognition." This approach, Stieg argues, tends "to confuse debate over intellectual foundations by substituting feeling for reasoning . . . it adds an anti-intellectual element that compromises the claims of librarianship to be a learned profession."[2]

Issacson, whose essay is summarized here, maintains that today the social perception of intellectualism is more important that the intellectualism itself. "The chief characteristic of an intellectual is the capacity to make discriminating judgments; the chief characteristic of an anti-intellectual is to 'discriminate' against that very capacity. [3]

The basis of the prejudice, according to him, lies in the long-established social tradition of distrusting the life of mind. It is seen in the characterization of an intellectual as one who is condescending, anti-democratic, judgmental, and prejudiced in value judgments, living off ideas rather than for them. In general, people are impatient with careful thinkers, perceived as those who are finding problems where none seems to exist, who criticize contradictions, and who answer old questions by asking new ones.

The philosophically oriented individual, dedicated to discovering new ideas, is not a model to be imitated in a very pragmatic society which prefers quick solutions to complicated problems.

Issacson notes that a number of librarians share with their society its anti-intellectual prejudices, although they themselves have been victims of such bias. These people feel that a theoretically oriented librarian does not fit the stereotype in that he or she seems to be a contradiction of the librarian's traditional image as preoccupied with the physical aspects of the library and with efficient service of its collection.

Some librarians maintain that there is no time in the field for reading on the job or for bookworms, misplaced specialists who are not willing to commit all their time exclusively to serving the public. They argue that the librarians raison d'être is service to others; they overlook a simple fact that service is not tied to the reference desk or the physical book alone. To be concerned about philosophical aspects of the discipline does not imply that one has to neglect his responsibility for service. It is also a mistake to assume that intellectuals necessarily conform to certain personality types, as satirized by the stereotype of an introvert or a narrow-minded specialist. Nor is there a conflict between intellectual viewpoints and efficient operation of libraries.

The real issue, Issacson maintains, is how the intellect is applied to the library situation. Obviously, the distinction between the theoretical-intellectual, and practical non-intellectual, librarian, viewed as unconcerned about the role of each other, is wrong. The statement that librarians work with books as tools but not as scholars is misleading. A reference librarian versed in the organization of an index only but not acquainted with the subject matter related to that index cannot provide professionally effective service to the patron. Similarly, showing the patron how to find 'information' without interpreting its meaning is an anti-intellectual prejudice. "To think like a librarian is not to think differently from a non-librarian, but it is to concentrate the mind on problems most nonlibrarians don't think about."[4] Reference is not merely a problem-solving activity, but also a teaching function. Books are not only to be shelved, or preserved, but are also sources of information, enjoyment, and knowledge.

In librarianship, information and its sources or rough data are often assumed to be equivalent with knowledge. It is overlooked that these sources are meaningless by themselves, unless they are interpreted by the patron and often with the librarian's assistance. Thus the real issue is how to apply intellect in librarianship.

Butler has also reminded us of the need to balance the intellectual with emotional approaches to environment. Excessive intellectualism that leads to a form of preoccupation with information on a theoretical level at the expense of emotional experience in absorbing that information leads to a decline of both the emotional and rational views of reality (Butler, 1943).

### 9.1.3 Definition of Intellectual Environment

The world is real and constantly changing, hence our knowledge of it will never be complete; all that is possible is to interpret known facts as they appear to us at a particular moment and in a given context, with other known facts.

As already pointed out, the distinction between reality and its appearance is a subject of many philosophical interpretations. For Protagoras, each aspect of reality was interpreted differently by each individual. Berkeley maintained that all qualitative properties of reality are apparent. Kant made a distinction between the appearance of the things and the things themselves.

Librarianship deals with the reality as it 'seems to appear' at any given moment to any individual; although the appearance itself may actually be that very reality. What it actually is can never be fully verified because the interpretation always depends on the psychological background of a particular interpreter of that reality, as well as on the completeness and intellectual level of its interpretation.

The uniqueness of each intellectual environment is a paradox: no two experiences are the same, yet no events or their interpretations are independent of each other, since everything in the universe is interwoven in a continuous pattern of shifting relations. The circularity of that paradox is minimized by the notion of relevance, that is, by selecting only relations relevant to the specific needs (Bronowski, 1978). The principle of relevance is illustrated by models which always reflect selective relations, or by any library collections aiming at a selected audience.

This is a metaphorical approach focusing on a subjective perception of reality as it appears to be related to other perceptions, together constituting our understanding of that reality.

### 9.1.4 The Three-dimensionality of Information Environment

Common to all types of librarianship are the relationships between the receiver of communication (alpha), the meaning communicated (beta), and the carrier of the message (gamma).

The concept of three-dimensionality does not imply that the reality is in fact three-dimensional; it merely reflects a selection of factors considered in this study to be a major influence on intellectual environment. Models do not dispute empirical descriptions of reality; they offer hypothetical interpretations of relations between different experiences or observations of that reality (Locke, 1967). A tripartite structure of a model provides the minimum number of viewpoints necessary to describe the multiplicity of relations between them.

A philosophical model proposed here represents a reality as a network of interrelations between three basic perceptions of that reality. The first is physiological, empirical observation based on a direct stimulation, or indirect recall of previous related stimulation created by some aspects of external world. This is the only empirically verified input from the external reality. The second is psychological interpretation of responses to these stimulation, which vary with each individual's unique psychological makeup, such as a degree of sensitivity, motivation, or will. And the third is philosophical, conscious awareness of the experience, which is logically related to past experiences.

A corresponding model of library reality consists of three distinctive dimensions: (1) the procedural, physiological dimension of acquiring, organizing, and disseminating information records (Pd); (2) the contextual, psychological dimension interpreted in terms of the environment provided for the use of library resources Cx); and (3) the conceptual, philosophical dimension of analytical relationships between library stimuli and patron's responses (Co).

Proceduralism addresses the issues related to the processes of librarianship and focuses on the alpha-beta-gamma transfer. Conceptualism aims at a formation of the basic concepts in the philosophy of librarianship and concentrates on the product of the alpha-beta-gamma transfer, and contextualism interprets the conditions of the alpha-beta-gamma processes and their outcomes. Each individual's own interpretation of reality is an expression of the three approaches; interrelated by the 'if-then' proposition -- that is, if a given dimension is predominant, its interpretation of the reality will over shadow but not totally eliminate other interpretations.

The interrelationships between the above three dimensions in the metaphorical model constitute the essence of metalibrarianship. This reinforces the notion that there is no one correct way of interpreting library reality. Information transfer depends not only on the information records, their author, or their receiver, but also on the intellectual environment of the transfer.

### 9.1.5 Significance of Intellectual Environment

Intellect is a cognitive faculty of mind, aiming at discovering relationships between various perceptions of reality and relating them to other experiences. Knowledge of reality is expressed by ideas about it, experienced physically or mentally by an individual, either directly or through some means of communication. The brain, physically similar in all individuals, correlates these experiences differently for each individual, reflecting their different intellectual background. The intellectual level of each individual is expressed in terms of that person's capability to relate various experiences to each other, making his or her present experience meaningful in terms of past experiences (Long & Welch, 1971).

Intellect is an active, motivating force in search of better understanding of conceptual interrelationships. For example, passive knowledge of library classification may be helpful in finding a particular, physical volume, while intellectual curiosity to learn more about the classificatory system itself will provide better access to other books on similar subject. Hence, to repeat, the major objective of the library intellectual environment is to provide opportunities for better understanding of reality, by extending the access to the recorded knowledge about it.

## 9.2 Interpretation of IE in Librarianship

### 9.2.1 Introduction

"Information is not a property of documents, nor of bibliographic records, but the relationship between the data and the recipient,"[5] hence the basic social values of the library are not its resources or services, but the opportunities offered to a patron to utilize available resources according to his or her intellectual needs.

However, the library is much more than just the provider of information (Apostle & Raymond, 1986). It should stimulate creativity in the use of resources by facilitating browsing, free-text searching, and concept-focused subject headings (Bawden, 1986). Psychological needs for intellectual environment should focus less on technical and more on metaphorical approach (Sheridan, 1986).

The user's subjective psychological attitude toward information-seeking activities and his indirect use of philosophical introspection calls for development of analytical, critical, and evaluative skills in interpreting library resources (Ford, 1986).

The social responsibility of librarianship extends beyond the bibliographic organization and interpretation of information records into the development of the environment that would satisfy intellectual needs of individual patrons. "Failure to use one's intellectual capacities . . . may lead to a sort of intellectual atrophy and to rapid deterioration of the ability to perform even fairly elementary mental tasks."[6]

I have selected two literary examples that illustrate the description of intellectual environment in librarianship on the three different levels. Both discuss the place of intellectual aspect in library education, Swanson concentrates on the process of formulating its goals while Khursid offers a historical review of its proponents viewpoints.[7]

### 9.2.2 As a Goal-setting Process (Swanson, 1964)

Swanson maintains that information science, technology, retrieval, and documentation are all integral parts of library science. The intellectual foundation of so-defined library science must be formulated in terms of its goals. The process of formulating these goals, described by Swanson, can be considered on three different levels.

(a) The goals should be stated in the context of the user's needs and behavior, as distinguished from the means to accomplish them. Issues to be considered include the relationship between the library and its patron, reviewed in terms of the library mission as an agency of culture. The library role in disseminating published material should be based on understanding the profile of the reader, the types of communication channels, and their significance. Equally important is the speed of library response to patrons' requests for information. Once goals are established they should be followed by system analysis which would assist planning for resources, equipment, automation, and estimation of costs to implement the plan. This is an example of considering library science in a contextual dimension of intellectual environment.

(b) The concrete issues in intellectual access to information include specific library operations such as indexing, subject analysis, reference, bibliography, and issues related to classification and cataloging. The latter include semantics, syntax, thesaurus compilation, generic search, file storage, organization, and mathematical and linguistic analyses of communication problems. The list describes the procedural aspect of the library's intellectual environment.

(c) And finally, designing book-selection, developing optimal allocation of resources, and identifying the criteria in evaluating the quality of a collection are all, according to Swanson, issues that can be addressed by different specialists, among them philosophers, sociologists, mathematicians, engineers, classificators, bookmen, librarians, documentalists, and information scientists. This is the conceptual level of determining the relevance of any of these activities, such as, in the case of librarianship, the relationship between retrieval effectiveness and depth of indexing.

### 9.2.3 As an Interpretation of Library Mission (Khurshid, 1976)

Khurshid provided a comprehensive list of librarians who addressed the question of the intellectual foundation of the discipline. He concluded that the concept of intellectual foundation can be described in terms of librarians' different attitudes toward their mission. Their views can be broadly divided into three perceptions of that mission, reflecting: (1) love of ideas expressed in books; (2) an encyclopedic grasp of knowledge; and (3) academic subject specialization. The objective of library education, Khurshid maintains, should be to promote book culture, because the foundation of librarianship rests on recorded knowledge.

His long list of writers expressing a variety of these views can be rearranged into the three major groups discussed in the previous section.

### (a) Procedural Perception

The most prominent approach is the pragmatic view of the reader's mind, perceived as Locke's *tabula rasa*, that can be influenced by reading. The book content stimulates the individual's nervous system and produces sensory reactions, which in turn, are interpreted intellectually. The reader accepts the values expressed in the book by asking a structural question: What is the specific reality described in that book? Anticipating the question, librarians attempt to guess what kind of reality the patron is interested in, before suggesting to him or her the reading material.

Library writers representing this viewpoint, according to Khurshid, include managers of library facilities such as Naudé, who maintained that a librarian is a born specialist in the sources of information and scholarship, and John Drury, who considered the librarian to be a trader, treasurer, and dispenser of knowledge. Among contemporary librarians, J. Christian Bay (1931) compared librarianship to medicine, Ortega (1961) made librarians masters of books, doctors and hygienists of reading, and R. Irwin (1949) defined librarianship as an applied bibliography that includes paleography, service, book selection, cataloging, and classification.

The requirements for a procedural librarianship included acquaintance with books, readers, and society as a whole, advocated by Wellard;[5] and book appreciation, scholarly disposition, and social mindedness, suggested by Reece (1936). The librarian should simply be, according to  Carl White (1964) and M. Wilder-Hart (1956), a bookman. Others suggested citizenship, scholarship, administrative and technical abilities, and acquisition of all fields of knowledge, with specialization only in some. B. Sayers stressed the importance of the personal characteristics of the librarian, and Carnovsky (1962) talked about his judgmental ability.  Williamson (1923) in his report called for separation of clerical and professional duties.

One of the older descriptions of the procedural approach, reflecting the state of technological knowledge at the time, was Ebert's (1820) call for a possession of a knowledge of history, bibliography and basic disciplines, rapid handwriting, knowledge of carpentry, and ability to repair books.

(b) Contextual Perception.

Closely related to the pragmatic view of the practicing librarian is a current interest, especially among public-library advocates, in motivating patrons to read. Reading, they claim, will bring readers to the library, reinforcing its reading environment. Here emphasis is on the individual's unique sensory reaction to the physical stimulation provided by reading a book. The imprecision in determining patrons' needs, which are constantly changing, is troubling, however. That variation is seen as a reaction to changes in both (a) the external patron's environment, resulting from shifting demands imposed by the patron's work environment, and (b) changes in his personal environment, manifested by a constant redefinition of his own self-image. The changed demand of the environment affects the intellectual needs of the individual. The question asked here is functional: How relevant is the reality dealt with in a book to the reality experienced at a particular time by the patron? This is also a familiar problem faced by the reference librarian who tries to anticipate the aspect of reality of interest to the inquiring patron.

This approach is represented in Khurshid's list by writers focusing on the role of librarian as an interpreter of knowledge. Cassiodorus expected librarians to have sound learning, developed by reading and copying of books. Wheeler (1946) called for introducing subjects which are of academic value in library school's curricula. Danton (1934) stressed the importance of mastering scientific literature. Metcalf (1943) summarized this particular intellectual environment of librarianship by arguing for strong background in science and literature, taking from sociology its institutional character, from education its cultural values, and from philosophy its general theory of learning.

(c) Conceptual Perception

Probably the least understood is the third approach, trying to explain the way the patron mentally interrelates the curiosity to understand better the environment aroused by his physical and psychological experiences. Here the awareness of insufficient knowledge of a particular aspect of environment leads to an increased need for more information in other areas. The question asked is relational: Why does a selected record interpret the reality in a given way? The patron searches for answers to this question by testing the content of a book, while the librarian finds the answer in the feedback from the user of the material.

Librarians representing this approach include Munn (1936), for whom the librarian is a scholar. Shera (1964) expanded the field by introducing social epistemology involving all fields of knowledge, and the philosopher Kaplan (1964) by including library science in the group of metasciences. Cotton Des Houssayes (1780) expected librarians to have vast and precise knowledge of arts and sciences. L .C. Powell (1959) would not be satisfied with librarians possessing less than encyclopedic knowledge, which to Thompson (1931) could be obtained by book-learning habits.

## 9.3 Metalibrary Interpretation of IE

### 9.3.1 As an Interpretation of Reality

In metalibrarianship, the different approaches to the understanding of intellectual reality are summarized in Fig. 9-1.

As shown in the table, the structural aspect of reality is represented by a descriptive theory. What is most important here is the content of the collection and the extent of efforts made to maximize access to it, either directly, through the expansion of library's own collection, or by developing efficient interlibrary cooperation.

| Reader's | Metalibrary Interpretation of reality in: | | |
|---|---|---|---|
| Perception of Reality | Theoretical Models | Selective Collections | Interpretative Services |
| Structural: What is X? | Descriptive Hypotheses | Focus on Content | Provision of Data |
| Functional: How is X Manifested? | Reasoning by Analogy | Specific Arrangement | Information Retrieval |
| Relational: Why X is Interrelated? | Metaphorical Interpretation | Classificatory Relevance | Research and Reference |

FIG. 9-1 Interpretation of Reality in Metalibrarianship.[9]

The functional approach is developed by analogy with other similar manifestations of reality. The rational is explained metaphorically by defining the lesser-known aspect of environment in terms of its more familiar manifestation. Of significance here is the arrangement of the available material, its classification, and the effective method of its retrieval.

The relational approach is based on a metaphorical model, reflecting the dependence of the interpretation of reality on the subjective interrelationships between its different appearances and their relevance to any particular situation. This area of librarianship is the least known and most in need of research.

### 9.3.2 As a Thought Process

Metalibrarianship is here defined as an abstract system that interrelates generic needs for knowledge expressed by an individual with equally generic recorded means available for that individual. The focus is on the constantly changing metaphorical relations between given and newly perceived dimensions of reality, as they are expressed in information records (Nitecki, 1981).

The IE model is based on the concept of human synergy: an individual's intellectual ability to combine a multiplicity of interacting principles into a composite, three-dimensional view of reality. It relates to the physiological concept of a metaphorical mind defined as an equilibrium between the rational, analytic half of the brain with the emotional, creative half. It treats all the inputs to brain as fragments of the whole reality, each modifying the existing image of the total reality (Samples, 1976).

Traditionally, thinking is perceived as a product of other processes, illustrated, for example, by a comparison of the pictures of reality with the ideas about that reality. In this section, however, I follow the definition of thinking as a creative process of detecting relations between different ideas or sensations of reality in terms of the similarity and relevance between them (Reeves, 1965). Thinking is our way of seeing reality, and the theories about thought processes correspond to the theories about reality.

The Stimulus-Response approach focuses on thinking as a process of body responses to external stimulations. Here "thought is simply behavior -- verbal or non-verbal -- covert or overt."[10]

Definition of thinking processes in Gestalt psychology is made in terms of responses to the complex, total stimuli. In this process the meaning of stimuli is grasped as a dis-equilibrium in the prior intellectual concept of reality, caused by the introduction of new factors (Berlyne, 1984).

Conceptually, the thinking process brings the physical and psychological interpretations of reality into a coherent, unified concept, expressing both the physiological responses of the nervous system and the psychological, emotional reactions to the perceived reality.

Hence the thinking processes provide a link between the three dimensions of reality, interrelating the perceptions of both the author and the receiver of recorded information.

### 9.3.3 Metalibrary Model of IE

#### (a) IE Process

An individual responds to the physical stimulation of data by creating his own mental image of the reality represented by the data in terms of newly received stimulation. The interpretation of the stimulation is made in terms of available information about it. That info-stimulation is then compared with images already registered in the mind by previous info-stimulations.

This results in expanding the individual's knowledge of reality into new intellectual images of that reality within an ever-changing data-information-knowledge continuum.

In this process of emerging intellectual reality, "every act of awareness is a recognition . . . that it is a product of prior relations now raised to consciousness through the recognition of similarity."[11] The reality is expressed in librarianship by collections of records about it. For example, a patron's inquiry about that reality may be satisfied in three ways: (1) structural, in which selected aspects of reality of interest to the patron are presented in the form of a descriptive cataloging of collection; (2) functional, in which classification of the library collection reflects relevant aspects of reality by analogy to other similar aspects, experienced by the patron; and (3) relational, focusing on a specific interdependence between different, less or more familiar aspects of reality, explained metaphorically and determined by the relevance of a particular selection of material to the patron.

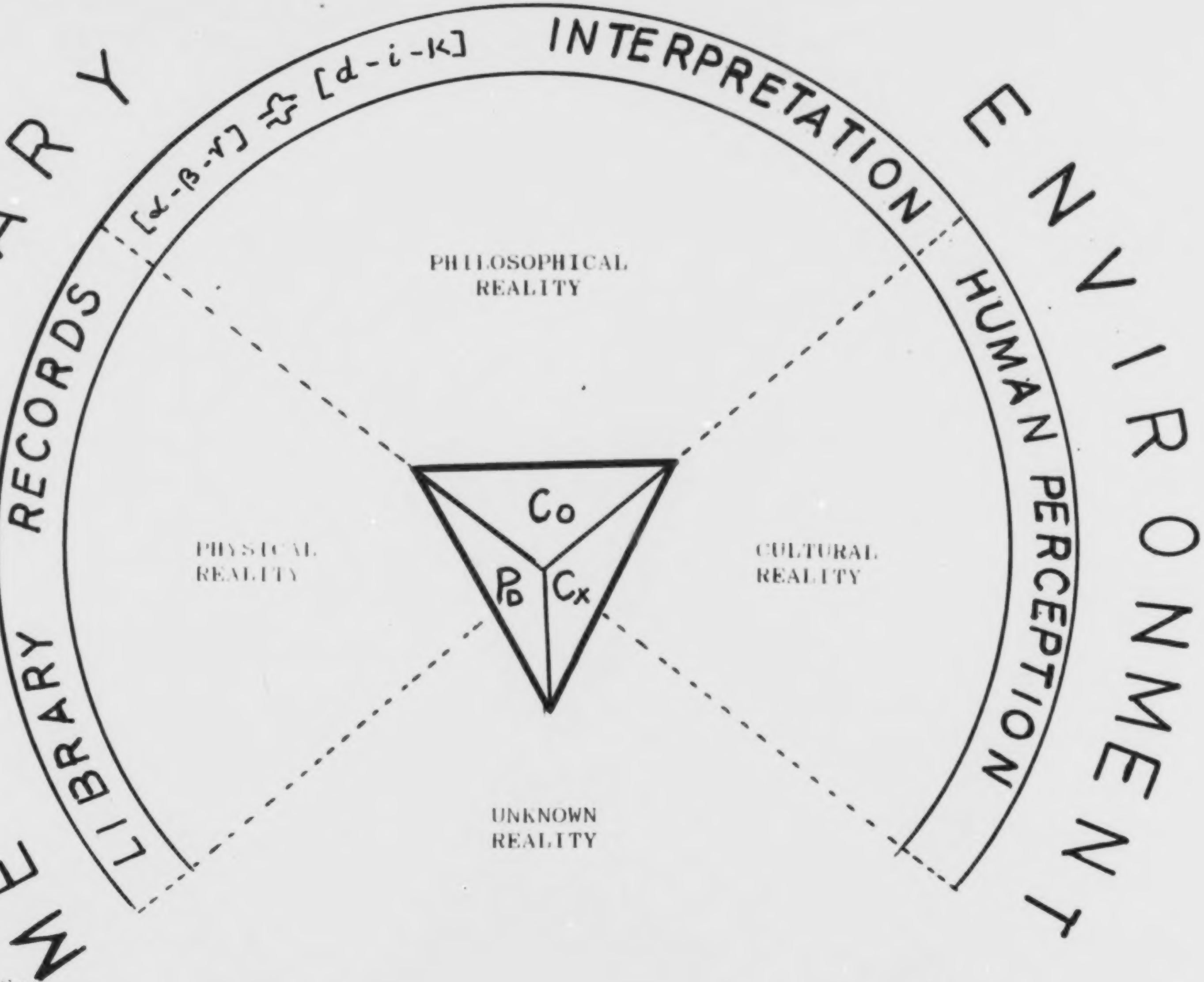
The intellectual library environment offers an individual patron an access to source material relevant to a variety of his needs, from empirical interest in the physical aspects of reality, humanistic insights into the subjective realities, and philosophical interest in its rational dimensions.

### (b) The Three-dimensional Interpretation

The metaphorical synthesis interrelates the three types of reality in the library's intellectual environment: (a) physical reality of library records, (b) cultural reality of human perception of the records' meaning, and (c) philosophical reality of interrelationships between specific alpha-beta-gamma relationships and data-information-knowledge transfer processes. Each of the realities is interpreted at procedural (Pd), contextual (Cx) and conceptual (Co) levels. [Fig. 9-2]

This synthesis provides a logical explanation of stimulus-response sequences, it clarifies the unpredictability of the patron's inner-driven responses, and it incorporates these responses into a model of metaphoric reality.

The model accounts for the logical objectivity of the process describing the reality, and its subjective interpretation by individual patrons, by incorporating seemingly unrelated individual experiences into a totality of cumulative society's -- as well as the individual's -- understanding of reality. This approach should satisfy the pragmatic goals of practicing librarians and the theoretical objectives of information scientists, since it recognizes the existence of different goals and habits in both practical and abstract thinking and suggests a common denominator for both the empirical and metaphysical interpretation of reality.


METALIBRARY ENVIRONMENT
LIBRARY RECORDS
[α-β-γ] ⇔ [d-i-k]
INTERPRETATION
HUMAN PERCEPTION
PHILOSOPHICAL REALITY
PHYSICAL REALITY
CULTURAL REALITY
UNKNOWN REALITY
Co
Pd
Cx

INTERPRETATIONS:
Pd - Procedural
Cx - Contextual
Co - Conceptual

FIG. 9-2: METALIBRARY REALITY [12]

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## NOTES

1. The ideas expressed in this part of the book are freely borrowed from my previously published essays.

2. Stieg, M. F. (1992). *Change and Challenge in Library and Information Science Education.* Chicago: American Library Association, p. 10. Note also Patrick Wilson's criticism of Stieg's essay as "a profoundly reactionary book, showing a strong distaste for the kind of research, development, and professional practice in information work that is gradually growing from deep roots in bibliography and librarianship." "Book Reviews." *College & Research Libraries*, May 1993, vol. 54, no. 3, p.276.

3. Isaacson, D. (February 1, 1982). "Anti-Intellectualism," in American Libraries. *Library Journal*, 107(3), p. 232.

4. Ibid., p. 231.

5. Matheson, Nina (1984). Quoted by Battin, P. (Summer 1984). "The Electronic Library - A Vision for the Future." *Educom Bulletin*, 12-17, p. 13.

6. Granick, S. and A. S. Friedman (1973). "Educational Experience and the Maintenance of Intellectual Functioning by the Aged; An overview." In L. F. C. Eisdorfer and J. E. Blum Jarvik (eds.), *Intellectual Functioning in Adults: Psychological* and *Biological Influences*. New York: Springer, pp. 59-64.

7. The two viewpoints discussed here are the summaries of essays by Swanson (1964) and Khurshid (1976).

8. Wellard, J. H. (1940). *The Public Library Comes of Age*. London: Grafton, p. 147.

9. Nitecki, J. Z. (Spring/Fall 1987). "Cognitive Processes and Librarianship: Review of Literature in Search of a Model." *Current Studies in Librarianship*, 11(1/2), p. 8.

10. Skinner, quoted by Berlyne, D. E. (1984). "Thought Processes, Theories of." In *The New Encyclopedia Britannica* Chicago: Encyclopedia Britannica, Inc., p. 641.

11. Yolton, J. W. (1962). *Thinking and Perceiving*. LaSalle, Illinois: The Open Court.

12. Nitecki, J.Z. (1987), op. cit., p. 10.

# CHAPTER 10:
# THE CONCEPTS OF INFORMATION AND KNOWLEDGE REVISITED

> What we have here is an example of something that has happened many times before in the history of science. A word that has a long-standing, common-sense meaning is lifted from the public vocabulary and then skewed toward a new, perhaps highly esoteric definition by the scientists. The result can be a great deal of unfortunate confusion, even among the scientists themselves, who may then forget what the word meant before they appropriated it.
>
> Theodore Roszak [1]

## 10.1 Introduction

Attempts to define information go back to the 1940s and continue up to today with little, if any, consensus. Wellisch analyzed thirty-nine pre-1970 definitions of information science (IS), finding only eight of them based on the definition of information itself. "Yet even the eight valiant definers of 'information' as the central concept with which IS is concerned do not succeed to arrive at an agreed-upon definition, nor do their definitions have any common elements . . . "[2] Schrader's extensive dissertation on the definition of library and information science identified 134 synonyms used for the term 'information', thus illustrating "the multiplicity of vague, contradictory, and sometimes bizarre notions of the nature of information."[3] Some of these synonyms are cited later in this essay.

Early definitions provided by Hayes are closely related to the theme of this book. He made a distinction between data ("anything recorded in a form which can be processed"), information ("the result of processing data"), knowledge ("accumulated data, which has been systematized, formulated, and evaluated") and wisdom ("subjective, ethical, judgmental")[4] He defined information science as "the study of information-producing processes in any information system in which they may occur."[5] Library is one such system, and "information science is becoming an integral part of library education, an increasingly important part of the librarian's professional and operational responsibility, and a part of the theoretical foundations of librarianship."[6]

The lack of agreement on the basic concept of information within Information Science brings into question its scientific status (Yovitz, 1969). Fairthorne (1965) called for abandoning the term 'information' altogether. Vagianos (1972) considered the unpredictability of the transition from data through knowledge to wisdom as the reason for lack of a satisfactory definition of information. In a more optimistic vein, Diener argued that "because information is so fundamental to sociality (it is ubiquitous to all human and societal interaction), we need to develop our own general and specific theories, hypotheses, research methodologies, and units of measure."[7]

## 10.2 Information-Knowledge Relationships

### 10.2.1 Introduction

A lack of agreed definition of 'information' among librarians and information scientists leads to a considerable confusion about the relationships between the concepts of 'information' and 'knowledge'. It is suggested that conventionally understood information and knowledge are different stages of the same continuous process, in which an individual integrates newly perceived data into the already existing system of 'relations known,' linking together data previously comprehended, and thus expanding the scope of that person's understanding.

Separately, information describing data and knowledge comprehending their meaning are neither similar nor mutually exclusive autonomous concepts; but together, both are the components of data-information-knowledge processes. An awareness of the universe around us consists of relating perceptions of various aspects of that universe into some integrated patterns.

Information is considered in this chapter as a shorthand term for a description of a cluster of perceptions brought to our attention, but not yet fully assimilated.

Knowledge is perceived as a state, at any particular time, of 'relations known' that are expressed in a system of knowing that has been already acquired by an individual. The new 'knowledge' is always a result of an individual's own subjective series of data-information-knowledge transformations, and not a product of some external, objective knowledge, unaltered and transmitted in toto from outside sources.

Following the overall theme of this book, I distinguish among three different levels of interpreting knowledge by reviewing the concept in empirical, contextual, and conceptual contents.

On the empirical level, knowledge is described by reference to the linguistic conventions; it deals with rules governing a given process and its representation by a static, figurative meaning of knowledge, expressed in symbols such as the printed message.

The contextual definition of knowledge is prescriptive, addressing the most effective use of actual empirical experiences. It is hospitable to concept of 'operative' knowledge, Ryle's (1949) 'know-how' to act in a given situation, and 'knowing how-to' do things efficiently. It refers to specific knowledge in a specific context; one becomes knowledgeable about things by an actual acquaintance with them (Russell, 1912) and by understanding their observable causal relations.

The conceptual notion of knowledge accepts a platonic focus on the essence of things, ideas, and forms, and the explanations of their meanings. The knowledge that something is true is intuitive or it is inferred from either logically or empirically established relations.

The former, intuitive approach assumes the existence of knowledge independently of the human mind. The latter, rational approach implies that knowledge is a system of relations as they are perceived by an individual. The argument of this essay rests on the rational concept of knowledge.

In all cases, knowledge is an idea, an abstraction which is open-ended, constantly changing in terms of newly acquired understanding of relations among different aspects of reality.

### 10.2.2 Contemporary Interpretation of Information-Knowledge Relationships

Depending on the definitions of information and knowledge, the definition of relationships between these two concepts stretches from identity to mutual exclusivity. As identical or very similar in meaning, the two concepts are often used as nouns, standing for a content of a message. For example, the statement defining information as a raw datum and knowledge as organized data implies that since data are essential components of both information and knowledge, the two concepts complement each other.

Identity or near similarity is also implied by definitions such as 'information is knowledge of facts,' 'knowledge is processed information,' or 'information is a coded fact that can be stored, retrieved, and transferred.'

Those definitions suggest that information and knowledge are of the same kind, knowledge being considered as a more developed form of information. It follows, then, that information is knowledge, hence, both information and knowledge can be identified by observation, retrieved by a librarian, or processed by a computer. It also suggests that knowledge resides in an environment independent of human beings, and that it must be discovered by humans in order to be perceived.

The opposite view, defining information and knowledge as mutually exclusive terms, or maintaining that they reflect at least two basically different notions, implied that the process of relating the two terms to each other results in a total change of one concept (information) into another (knowledge). Here the two terms are used as verbs, emphasizing the process of transference itself rather than the content of the transfer. This approach raises the issue of relevance in transferring 'something in information' into something else in knowledge.

A definition of information as data about matter determined empirically and of knowledge as the philosophically inferred essence of that matter illustrates a view of a mutually exclusive meaning of information and knowledge. For example, Boorstin (1982) maintains that an examination of certain characteristics of a book may identify the type of knowledge that distinguishes it from information. Such a view assumes that not all information is knowledge, and that knowledge has to be created by human beings. The two concepts are not the same; they may supplement but not substitute for each other.

Still another view is expressed by Machlup (1980), who takes a position in between the two just described. He states that information and knowledge, considered as parts of a content, are synonyms, while when information represents a process and knowledge a content of that process, the two terms are perceived as antonyms.

All approaches summarized above illustrate synecdochic problems created by considering only some selected characteristics of information and knowledge within an all-inconclusive definition--that is, by comparing or contrasting specific characteristics of one concept with the singled-out characteristics of the other.

In both cases of comparing or contrasting those characteristics, the totality of the meaning of the process or the content of the total knowledge is overlooked.

For example, Machlup's definition refers to information and knowledge as parts of the same general content, but not as the same parts of that content. Synecdochic misunderstanding may result in a false expectation. Thus, when information is identified with knowledge, learning about some external manifestation of phenomena is equated with understanding their total meaning. Or, when information and knowledge are considered different, but related by learning concepts, it is implied that data possess some mysterious power of directly changing acquired facts into understanding,

Information cannot be identified with knowledge, because it is only a specific or selected description of relation within the total knowledge, developed at a particular time by a given individual. Similarly, information cannot be considered unrelated to knowledge, since it itself is always a part of the total relations known. Finally, both concepts are always referring to a continuous relationship among newly acquired information (i.e., data) and static, at that time, knowledge (i.e., relations known).

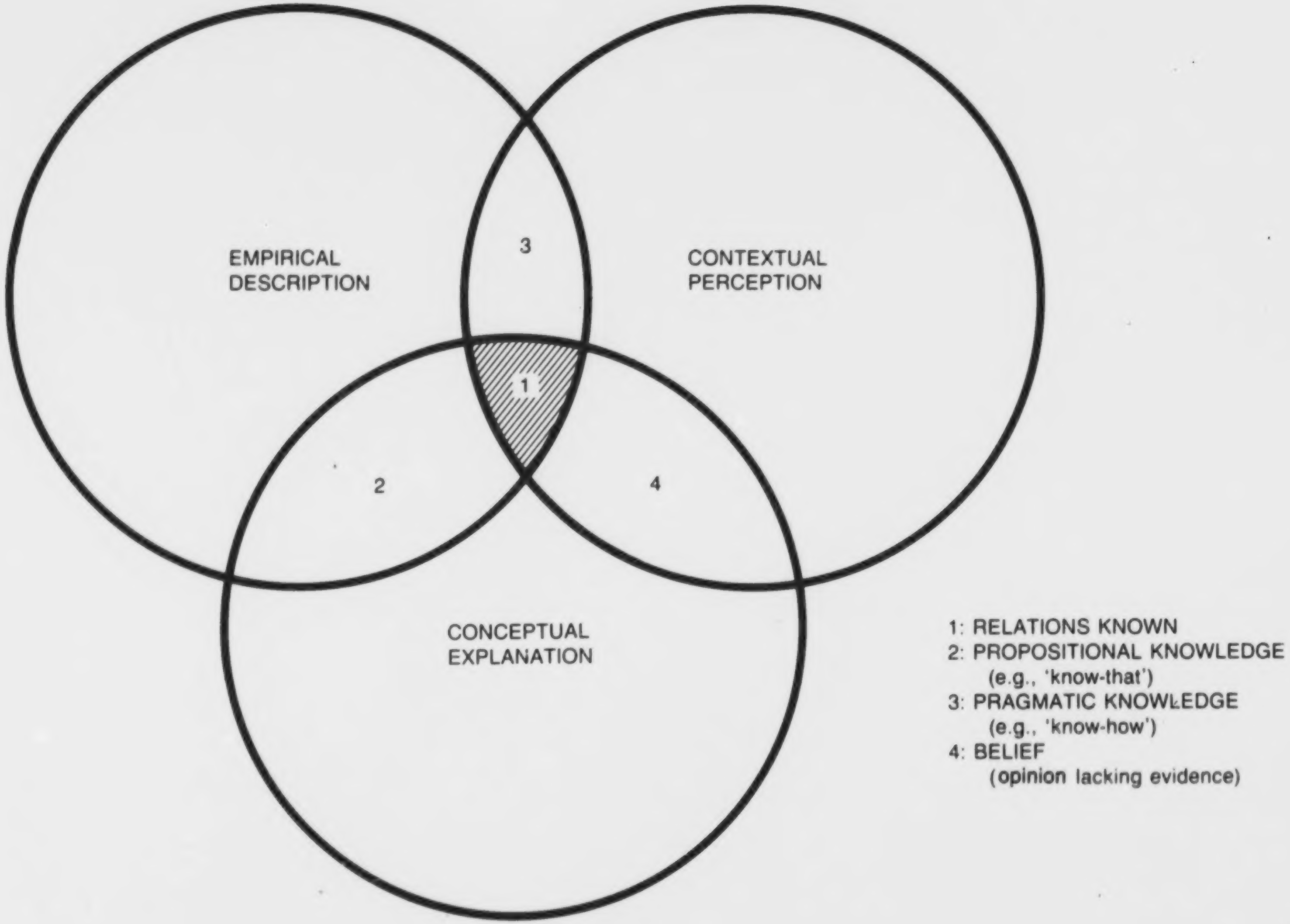
EMPIRICAL DESCRIPTION
3
CONTEXTUAL PERCEPTION
1
2
4
CONCEPTUAL EXPLANATION
1: RELATIONS KNOWN
2: PROPOSITIONAL KNOWLEDGE (e.g., 'know-that')
3: PRAGMATIC KNOWLEDGE (e.g., 'know-how')
4: BELIEF (opinion lacking evidence)

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FIG. 10-1: SCHEMATIC DEFINITION OF REALITY ?

In the diagram above, knowledge is defined in terms of relationships among empirical descriptions of observations, contextual, psychological perceptions, and conceptual, philosophical interpretations of data. The relationships between any two of the three approaches reflect different definitions of knowledge, as either propositional or pragmatic or as belief statements about reality. Thus, the process relates perceived data to the conceptual understanding of those relations.

The interdependence illustrated in the diagram offers some clarification, discussed elsewhere in this essay, of the dispute between materialistic and idealistic theories of librarianship by incorporating, within the definition of knowledge, the two opposite concepts of Wright's (1977) telus ('know-why,' a deductive theoretical process of thinking) and mechus ('know-how', an inductive empirical process of experimental knowledge).

The diagram also points to the role of belief in the definition of relations known. The belief becomes a part of that relation if it is verified by empirical evidence and if its meaning is explained in terms of the total relations known.

Belief considered alone as a psychological perception and/or unverified conceptual explanation is not a part of the relations actually known and is not discussed in this essay.

## 10.3 The Case of a Misplaced Descriptor

The foregoing discussion points to a major conceptual problem created by a lack of clearly defined notion of information, on which various theories of knowledge are formulated. In this section, I attempt to bridge different interpretations of 'information' by suggesting a model hospitable to many of them. To accomplish this, I demythologize the concept of information by suggesting a common denominator for its various definitions.

Information is here considered a descriptor of clusters of data. Unique to each information is the process of identifying specific relationships between different characteristics of data.

### 10.3.1 The Argument

Information is not an entity. It is a description of the group of characteristics (data) of that entity. In the summary of his review of the concepts of information for information science, Belkin cited several definitions of information defined as: a fundamental category such as matter; a property of matter; structure or organization; the probability of the occurrence of an event; reduction in the degree of uncertainty in a state of knowledge (or similar construct); an event that takes place when a recipient encounters a text; data of value in decision-making; public, communicated scientific information; and the message itself.[9]

None was fully satisfactory to him then, and all are rejected in this essay as definitions of information, considered instead as descriptions of data.[10] As such these definitions make sense within the scope of the universe they describe. The more detailed the description, the better the understanding of the reality under consideration.

Is this merely a semantic argument? Yes, if the focus is on the terminology alone. No, if the distinction is made between the entities reflecting given aspects of reality and the data that identify these entities, their properties and their description, by specifying in more detail the aspects of the reality considered, the role of the characteristics selected, and the way they are described.

Simply stated, it is suggested that the term 'information', as often cited in the literature, is a misnomer. It should be replaced in most cases, with the term 'data'. Each term stands for specific characteristics of reality, with the term 'information' reserved for the description of the relations between these characteristics. So interpreted, the term 'information' can be understood as an umbrella concept for a variety of descriptions of reality. Each description is subject to its own verification, thus making a distinction between the understanding reality, its records and its interpretations.

### 10.3.2 Definitions.[11]

#### 10.3.2.1 Reality

Reality is that which exists independently of thoughts and ideas about it and from which all other things, ideas, and events derive; it forms a basic matter of the universe, its substance. It is the fundamental state or quality that makes data what they are. In semantic definitions, reality stands for elements of a subject that refer to place, person, thing, state, or qualities.

#### 10.3.2.2 Data

Each datum [a noun] is a specific characteristic of a selected aspect of the universe. It is an attribute or quality of an object, or an event that always characterizes it but does not enter into its definition. It is that which is given: in epistemology, an actual element presented to mind; in psychology, the content of sensations, an intrinsic character or attribute of a conscious experience; in logic, that from which inferences may be drawn. A datum can be either given, perceived, or interpreted and considered as a form of activities, processes, changes, or products, or as a phenomenon, such as linguistic structure.

Each kind of data can be analyzed empirically as a mechanical part of the universe considered as a total machine; contextually within a given socio-psychological context, or abstractly as a relationship between observed, actual, and logical ideas.

### 10.3.2.3 Infoscription

To infoscribe [a verb] is a process of describing data as an activity, its product, or a phenomenon which is perceived at a given time and in a given space; and it is also a process of interpreting the relationships between activities, products, and phenomena on specific levels: bio-physical, socio-psychological, or metaphysical. Infoscription is in fact a major subject for the study of Information Science.

### 10.3.2.4 Information

The results of infoscription are infoscripts; the clusters of infoscripts become 'information' [nouns], recorded descriptors of both the relationships between clusters of data which are given, perceived, or imparted by the mind and/or their status, each reflecting a different subject area seen from a specific viewpoint. Information incorporated into existing system of understanding reality becomes 'knowledge' within that system.

### 10.3.2.5 Chain of Increased Complexity

Thus reality may be understood on different levels of complexity, starting with the data (characteristics of reality), followed by infoscription (the processes of describing relationships between data within a given universe), leading to the product of infoscription, information (selected clusters of infoscripts), and culminating in knowledge of that reality (infoscribed data incorporated into a given system of relations known).

Data and their descriptions vary, hence each information is different. Data can be variously classified; one such classification is suggested in the model proposed in this chapter.

## 10.4 Model for Infoscriptive Processes.

The purpose of the model is to identify basic common denominators for most of the definitions of information cited in the literature, using some definitions of information as illustrations for the model.

### 10.4.1 A Triadic Approach

One can identify a number of different descriptors, each combination of them providing different levels of definitions; the variation will depend on the kind of elements considered. In my model I identify three aspects of realities: the type of data, their characteristics, and the level of interpretation.

TYPE Data's characteristics
OF .............................
DATA Levels of interpretation

Each of the above aspects of reality can, in turn, be subdivided into a variety of sub-elements. We are focusing here on the simplest matrix, subdividing each aspect into three sub-elements, as shown below.

### 10.4.2 Infoscriptive Processes.

The table below (Fig. 10-2) describes knowledge in terms of relationships between different kinds of data, characterized as process, product, or phenomenon at three distinctive levels: bio-physical, socio-psychological, and logical.

```
-------------------------------------------------------------
     DATA           :          Data's Characteristics
                    :       Process     Product    Phenomenon
                    :         P1          P2           P3
   ------------------------------------------------------------
                    :        interpreted on three levels [L]:
                    :.........................................
Unspecified data:   :
   D - Assumed      :
Primary data:       :
   D1- Given        :   L1: Bio-physical, procedural [Pd]
Secondary data:     :   L2: Socio-psychological, cultural [Cx]
   D2- Perceived    :   L3: Logical, rational [Co]
Tertiary data:      :
   D3- Ascribed     :
                    :
   <---------------- K N O W L E D G E --------------->
   ------------------------------------------------------------
```

Fig. 10-2: Types of data

## 10.4.3 The Components of the Model

### 10.4.3.1 Data:

#### a. Assumed data [D]

Assumed data are unspecified, all inclusive, universal, and indispensable data that can be a part of any infoscription. For example, data referred to as synonyms to information: all, basic, broader than, essential, fundamental, intangible, raw data, commodity, entity, fact, form, item, pattern, product, resource.

#### b. Primary Data (given, constant) [D1]

Primary forms or substances of reality are inherent qualities (e.g., physical dimensions such as size and shape) which are inseparable from the objects and give a rise to perceptions that directly resemble the data as given, physical objects and systems; such as information's synonyms: brain, carrier, vehicles, marks, and biological, chemical, neural, factographic, observable processes.

For instance, information [i.e., data] defined "as a resource to be developed, used, reused, and traded as, for example, water, minerals, land, or power." [12]

#### c. Secondary Data (perceived, variable) [D2]:

Secondary forms or substances are nonphysical qualities, perceived by the senses; they are highly variable, producing various sensations such as the impact of environment, measure, power, super energy, change, stimulus, discovery, and transformation. For example, information is perceived in information science as: "the structure of any text which is capable of changing the image-structure of a recipient."[13]

d. Tertiary Data (ascribed, reactions to experiences) [D3]: Tertiary forms or substances are imparted by mind concepts, resulting from a subject's reactions to objects.

Tertiary data can be interpreted:

(1) psychologically, as mentality, cognition, consciousness, intelligence, thoughts, understanding;

(2) sociologically, as communication, opinion, culture;

(3) philosophically, as ideas, concepts, meaning, knowledge, state of knowledge, wisdom;

(4) linguistically, as semantic data;

(5) ethically, as data of value, quality, morality, judgments -- for example, "Information is defined as the logarithm of the number of choices."[14]

### 10.4.3.2 Attributes of Data: Infoscriptive Predicates of Reality

Data predicate the reality; they proclaim, declare, assert, affirm, or deny something of that reality by describing or characterizing the data's attributes. Three such attributes are here identified:

(a) Process |P1|: a purposive action, event, or occurrence leading to specific results. See for example, Wersig and Neveling's definition: "information . . . is a process which occurs within a human mind when a problem and data useful for its solution are brought into productive union";[15] or Debons' definition: "information is a process whereby data are received and interpreted by an intelligent being." [16]

Examples of Schrader's synonyms interpreted as the process synonyms |P1|: to become different, to transform, to have the form, to give structure, to organize; to function as processes and activities: e.g., communicating, decision-making, holding, interacting, maintaining, manipulating, planning, problem-solving, transforming, informing, or altering.

(b) Result of processes or activities [P2], such as: data described as products, a person, an event, or a thing produced by or resulting from a process, a substance obtained from another through chemical and other changes.

For example, "Information is the alteration of the image which occurs when it receives a message. Information is thus an event -- an event which occurs at some unique point in time and space, to some particular individual."[17]

Examples of synonyms for products of processes [P2]: communicated, evaluated, organized, perceived, processed, recorded, reproduced, shared, stored, decay, experience, growth, made, product, productive, activities, combination of increase, increment, reduction, recognition, resolution, transmission, received, used, transferred.

(c) Phenomenon |P3|: occurrences, observances, conditions, situational connections or mutual influences between two or more data, such as cause-effect, state of affairs, combination of circumstances, contributions or attributes modifying the facts or events; anything that is not considered a process or its results.

For example, Fairthorne notes that information is not an entity: "it is no more than a linguistic convenience," [18] or Otten and Debons (1970) define information as a 'fundamental phenomenon.'

Examples of Schrader's (1983) synonyms interpreted as phenomena |P3|: occurrence, situation, content; ties, links, commodity influence, qualitative and quantitative relations, anomalous, ascribed, circumstance, content, form, kind, meta-energy, potential, reference, relational, representation, subset, summation, symbol, system, useful.

10.4.3.3 Interpretative Levels:

(a) The empirical, procedural level of interpretation [Pd] consists of a description of relations between structural, physical, given data, each functioning as a description of either processes [P1], their products [P2] or phenomena [P3]. They include the factual, mechanistic, biophysical makeup of data and the description of the physical format within the data.

The interpretation itself is phrased in terms of the objective, physical world. It is based on a theory that all phenomena are totally explicable by a mechanistic doctrine which assumes that nature, like a machine, is a whole, whose single functions are served automatically by its parts. The universe is considered as an all inclusive mass-energy system, self-organized, self-regulated, with everything in it as a form (shape, structure, etc.) or as a process (energized capacity to change). The interpretation also has a functional dimension; for example, knowledge is represented in various library activities, such as acquisition, organization, control, storing, and retrieval of library material.

As a procedural theory, it deals with specification of steps to be taken, determined by the ends sought and based on empirical evidence, quantitative measurements, and principles abstracted from experience.

It is a scientific world view: predicative, accurate, and economical descriptions, defined in terms of actual operations, statistical inferences, decision theories, logical constructions, and empirical observations.

It is represented by philosophical schools such as pragmatism based on a rule of procedure, a technique to find a solution by clarifying the meaning of signs; or operationalism, stressing the presence of physical entities, processes, and properties identified from their operational verification.

Examples of Schrader's (1983) synonyms used in procedural interpretation of data [Pd]: biophysical, empirical, mass energy mechanism, material, mechanical or production focus, operational interpretation, sensory perception, structural or technical interpretation.

(b) The contextual level of interpretation [Cx] consists of data interpreted in terms of the totality of conditions which affect the particular facts or experiences. It is often purpose-related, always based on a particular context.

As a socio-psychological, subjective, environmental, and cultural approach, this interpretation is an expressive, emotive and behavioral description of attitudes toward the data, which are interpreted by the senses.

It involves presupposing circumstances or assumptions in a given context, e.g., the statement 'S implies X' is based on the context in which it appears.

The contextual approach resembles the perspectives of cultural, philosophical anthropology, which is concerned with the work environment and its cultural sociological aspects. It emphasizes the multiformity of human nature.

Examples of Schrader's (1983) synonyms used in contextual level of interpretation of data [Cx]: socio-psychological, societal, socio-historical, artistic, behavioral, contextual interpretations; cultural, environmental description, exchange between human, experience, human or life focus, objective state, language, focus on people, on person, on recipient, on social issues.

(c) Conceptual level of interpretation [Co] is an ideational interpretation of data in terms of the meaning perceived by the recipient of data; it provides a description of ideas about the data ascribed to them. It is a philosophical abstraction, conceptually described or explained.

The conceptual approach provides a balance between procedural [Pd] and contextual [Cx] interpretations; through it, the inner world of ideas is described by the laws of physics, perceived psychologically and discovered by reflection on values and beliefs.

Examples of Schrader's (1983) synonyms used in a conceptual interpretation of data [Co]: rational, abstract, analytic, logical, meaningful, relational, scientific, semantic, spiritual, subjective, symbolic, and synthetic interpretations.

(d) Variations in the description of data

Dependence of the descriptions of the same data on the level of their interpretation can be illustrated by reviewing, for example, the definition of information as 'reduction of uncertainty." [19]

In a given, real world [D1], explained mechanistically [Pd], information is a process of increasing the availability of data [P1] thus reducing uncertainty.

In a subjective, perceived world [D2], described on a subjective, human level [Cx], increased beliefs [P1] reduce doubts.

In an imagined, ascribed world [D3] the meaning [Co] of the proposition 'reduction of uncertainty' is proven by disproving its opposite, the increase of uncertainty.

Hence, at least the following classifications of the definition of 'reduction of uncertainty' are possible:

In a general interpretation of 'reduction of uncertainty' 'D}P1':

D stands for unspecified data of uncertainty
P1 stands for a process of reducing uncertainty.

In a logical interpretation 'D3}P1:Co':

D3 stands for conceptual (logical) uncertainty,
P1 stands for a process of reducing uncertainty,
Co stands for a logical interpretation.

In a physical interpretation of reduction of uncertainty about structural stress (e.g., in building design) 'D1}P1:Pd':

D1 stands for given uncertainty

P1 stands for process of reducing structural stress

Pd stands for physical (mechanical) interpretation.

In psychological interpretation of reduction of uncertainty 'D2}P1:Cx':

D2 stands for perceived uncertainty

P1 stands for a process of reducing uncertainty

Cx stands for its psychological interpretation.

## 10.5 Reinterpretation of Library and Information Science Definitions of the Term 'Information'.

Selected here are examples of different approaches to the definition of information. They represent physical, linguistic, and metaphysical interpretations of information-related phenomena in library and information science discussed at procedural, contextual and conceptual levels.[20]

### 10.5.1 General Level of Interpretation

10.5.1.2 Otten considers information as the common descriptor for all nonphysical aspects and interactions between and among man, machines, and the universe and as the common denominator for knowledge . . . the descriptor of a concept or phenomenon as fundamental as matter or energy.[21]

At the same time, however, he also discusses information as a commodity and a process, both interdependent with matter and energy, thus strongly suggesting its material base.

Interpreted in terms of my model, (a) Otten's term 'information' corresponds more closely to my concept of data; (b) his static and dynamic properties ("information stored or contained in something" or "associated with action, with a process,"[22] are extended in my model into three properties (P1, P2, P3); and (c) his three levels of information (structural, analytic, and semantic) are discussed by me as different levels of interpretations (Pd, Cx, Co). And finally, Otten's interrelationship between matter, energy, and information is discussed in my model as different types of data (D1, D2, D3).

10.5.1.2 Horowitz (1988) accepted the notion of a tridimensional reality of librarianship, developed by Nitecki (1964) and referenced by Shera (1972), and then considers it "implicit in almost any formulation of the library system."[23]

In her discussion of library curricula, Horowitz proposes her own framework for the theory of librarianship based on a distinction between three-fold reality, resembling Nitecki's conceptualizations: procedural, empirical ('functional' in her terminology), conceptual, ideological and contextual, administrative.

The functional, social-engineering dimension has "a mandate to develop effective methods and techniques to organize, control, store, and retrieve information."[24] (This is illustrated by Lancaster's (1977) focus on maximization of the access to information.)

The conceptual, planning dimension aims at "the development of an approach . . . to identify and synthesize the wide variety of ideas, theories, and models about the nature of information . . . "[25] (similar to Wright's (1977) emphasis on its metascientific character).

The contextual, cultural dimension of librarianship focuses on "the nature of the social need it must meet, and integrates theory and context to package services to meet that social need" (e.g., Shera's 'social epistemology').[26]

Horowitz's definitions of information also resemble in some cases the classification of the model proposed in this essay. She summarizes Levitan's (1982) view that information is "viewed as a cycle which includes the entire set of procedures, operations, and functions involved in the collection, evaluation, storage, retrieval, dissemination, and generation of information by a user."[27]

All this is based on the premises that: (1) information is a basic phenomenon, (2) it is perceived (3) as a semantic concept of a message, and is (4) differentiated from knowledge as its communicable form. In my model, those are the characteristics of data i.e., (1) given, (2) perceived, (3) ascribed, and when their description (information) is absorbed in a given system, (4) it becomes part of its knowledge.

### 10.5.2 Procedural Level of Interpretation

#### 10.5.2.1 Information as a Flow of Form (Young, 1987)

Young starts with the premise that the universe is a mass-energy system, and that the mind, as a part of that system, processes information. He defines information as a mass-energy form, since "every set or system of relations in the mass-energy universe constitutes a form of the universe, whether or not [it is] distinguishable as such to a given observer."[28] He included in that definition all mental events such as knowledge, emotions, volitions, consciousness, and mind itself, all viewed either as abstract information events, as flows of mass-energy forms, or as form-manipulating processes.

However, although all information is a form, the reverse is not always true, since they are many form processes that are not information. The distinction refers to two kinds of processes: morphological and kinetic. Information processes are relational and morphological, in which kinetic, energetic aspects are secondary. Patterns defined as the characteristics of a form are the primary ingredients of information flow. Young illustrates the distinction by an example: "When we say that a neuron fires a given number of spikes per second and that this activity transmits information, we are not saying that the neuron is transmitting anything other than the pattern of its firing."[29] The information is embodied in that pattern. Pattern means information that is preserved, while moved, in a transformation. Therefore any activity that involves communication of information preserves and transfers a form that is communicated, through a series of coding and recording processes. "At the most fundamental level, information flow can be defined as a relational-morphological, mass-energy activity involving representational (symbolic) form transfers between two or more mass-energy systems, a flow of form."[30]

A certain amount of energy is needed to communicate information, to preserve and transfer characteristics of a given form, i.e., its information, from one mass-energy system to another. The amount of energy is normally very small, within the limits, needed for its protection. Too little energy would prevent the transfer of the form, and too much of it would destroy the form itself.

As a relational process, not a form phenomenon, information flow can be identified without a specific frame of reference or context. As a relational activity, information requires at least the sending and receiving of sets of mass-energy systems; it is not a content of either system, but a transmission of a pattern between them. The meaning of information, its value or significance, is explained in terms of resonance. "Resonance can be defined as the phenomenon that occurs when two or more oscillatory systems influence each other's activity."[31] The interaction by resonance results in exchanging relational patterns, and this, in turn, influences the pattern of the receiving system.

As I pointed out elsewhere (Nitecki, 1989), Young attempts to develop an information model based on scientific, mechanistic premises, free from metaphysical speculations. His universe is a self-organizing and self-regulating system, consisting only of either objects such as forms, their shapes and structures, or processes represented by energy, a capacity to change. Information, as defined above, communicates changes between the systems. It becomes indispensable yet together with the concept of energy, it remains an undefined phenomenon. Similarly, some other models in information science are based on the notion of information as a content not only of brain processes but also of its product, the physical record or electronic data. Their focus is on information as a behavior-changing process, while in librarianship the primary interest is in the understanding the behavior-driven needs of the patrons for the information. Crucial here is the definition of information as that which satisfies those needs.

Young's model is an example of a procedural interpretation of information. The basic datum of the universe is a form, according to Young, "a fundamental, universal characteristic, an intrinsic and necessary consequence of the rationality of the mass-energy universe."[32] Form is present in "every object and event. It is a true universal."[33]

In the physical systems, the form is a given [D1] in my model, as a "structure, shape, configuration, arrangement, order, organization, pattern, relations, and essential nature or indwelling cause or principles,"[34] as illustrated by the wave characteristics of amplitude, wavelength, frequency, etc.

The perceived data, [D2] in my model, recognize and transform patterns by the scanning mechanism in the nervous system, as illustrated by the irritability of protoplasm in its reaction to external stimuli.

Ascribed data, [D3] in my model, provide for concept manipulation by abstracting on verbal and nonverbal levels through symbols and signs "created and used as a representation of an event or object, a process that in living organisms enables them to organize and manipulate internally the world of their perception."[35]

Each of the above kinds of data can be interpreted in my model procedurally, contextually, and conceptually.

Procedural interpretation (Pd) is evident in all physical sciences, e.g., in physics "matter and space are mutually interdependent manifestations of a single, whole system or process in which material particles are not distinct entities made of some separate stuff or substance moving through space, but are geometrical forms of or disturbances of the space-time continuum."[36]

Contextual interpretation is based on "frame of reference in which any set of mass-energy relations exists . . . must be seen as absolutely essential to a determination of its actual form characteristics, and therefore to its identity."[37] Likewise, information "cannot be identified in the absence of a context or frame of reference." [38]

Conceptual interpretation focuses on the form as a relation. "It is the form (relations), whether semantic, syntactic, experimental, or contextual, of the elements of language, and not the matter of which they are constructed, from which the mind generates meaning; the physical symbols themselves embody no linguistic meaning."[39]

It is not, for example, the printed words in language, but the arrangements between them, which signifies their meaning.

All three attributes of data identified in my model are also discussed by Young. Information is considered as a flow of mass-energy forms; the information-processing is evident, for example, in biological systems (e.g., single-celled animals' response to stimulation), conduction of electrical excitation in nerve cells, and coded patterns in computers.

The phenomenon of relations is considered to be the only concept that can interpret "all structure, shape, configuration . . . all order, organization, arrangement, all pattern, and all form . . . as consisting of sets or systems of relations between constituents." [40]

Finally, Young equates all data with information:

> Information is now a basic descriptive concept, not only in

communication theory, cybernetics, and computer sciences but also in . . . physics, chemistry, biology, and psychology . . . psychobiology . . . neuro-science, . . . electromagnetic field disturbances, sound waves, atomic excitations, and other physical phenomena, in the structure and function of chemical molecules, in the sensory activities and behavioral displays of animals, in the activities of neurons, nervous systems, and brains, and in the entire complex of psychological or mental processes, so that all cognitive functions, including perception, knowledge, thought, learning and memory, as well as emotion, volition, consciousness, and the entire phenomenon of mind -- are all now generally characterized by scientists as information-processing activities." [41]

For data to become information, they must be, according to Young, specified with respect to some frame of reference or context; they must undergo some set of relations with at least one other (receiving) system; they must become represented by altered form characteristics within the receiving system; and they must fall within certain minima and maxima of energy intensity or value.[42] This is in my model a process of infoscription.

10.5.2.2 Stonier proposes a theory of information based on the assumption "that information is a basic property of the universe [and] . . . like matter and energy [it] has physical reality." [43] It "has existed long before the appearance of human beings . . .

[and] arose the moment the universe began to organize itself."[44] Similarly to Young, Stonier distinguishes between two interrelated categories of information: structural information (contained in a system) and kinetic information (transmitted, processed or transformed). It achieves meaning in the context of a given perceptor system, and in an advanced form it is called 'intelligence,' a concept which can be extended from simple, proto-intelligence to the collective, global, human, and machine intelligence. "The emerging, ever more highly complex but integrated combination of human and machine intelligence will evolve into new, advanced forms of organization described as pure intelligence."[45]

Related to my model, in this theory the information is considered as an unspecified, assumed basic property of the universe [D], manifested either as a phenomenon of a given structure [P3] or as a process [P1]. Another theory will have to be developed, to explain the leap from the concept of 'information' to that of 'intelligence.' Such a theory of information, Stonier admits, does not exist.

### 10.5.3 Contextual Level of Interpretation

10.5.3.1 Smalley and Plum (1982) discuss the concept of information indirectly in its broad sense of information skills in library research by reviewing contextual approaches to bibliographic instruction in the humanities and sciences.

They define a contextual approach in terms of differences in the structures of the literature, the scholarships and the reference and access tools used in the two disciplines.

These differences illustrate the basically different data studied by each discipline, reflecting the proverbial 'two-cultures' syndrome. In the humanities the focus is on interpretative context of a particular work of art, such as, e.g., a poem or a painting, each considered a unique artistic experience, [D2] in my model; while in the sciences, the focus is on an experimental context in search of regularities in experience, based on the assumption of an independent universe, [D1] in my model. While the former data are perceived in terms of a humanist's own "personal, unique perceptions," the latter are discovered by the scientist's "close examination of regularities."[46]

The research process in the scholarship of the humanities aims at the justification of experiences, while in the sciences it aims at their explanation.

The relationships studied in the humanities are between the products of human creativity and the artist's personality, social experiences, and forms of artistic expressions.

In sciences the focus is on 'understanding relationships between patterns.'

The product of humanistic infoscription is a particular work of art, "reflecting complexities of personality, social experience, and form of expression";[47] that of scientific infoscription is a verifiable and reproducible pattern of regularities.

The phenomena of infoscriptions are in both disciplines a form of inquiries which originate in "distinctive conceptual structures, governed by what it means to understand in that area of knowledge"[48] and affect the processes of research and the reporting of their results. In the humanities, the scholars combine a discipline-determined conceptual framework with personal, unique perceptions.[49] In the sciences "the scientist's work is discipline-determined, and the methods, the theoretical assumptions, and the types of questions pursued are those that science has judged worthy."[50]

In this essay the contextual infoscription distinguishes between the two different realities, [D1] & [D2] in metalibrary model, reflected in different phenomena, products, and relationships between them, thus accounting for the contextual approach to bibliographic instruction that reflects the interactive processes between the learner's personal capacities and cognitive structures of different disciplines. [51]

10.5.3.2 Beagle's essay (1988) offers an interesting discussion of different levels of interpreting data about the universe.

Responding to a lack of definitions of information, Beagle recommends Bohm's concept of wholeness[52] as a context for theory in library and information science. His distinction between the mechanistic world-view and the contextual holistic approach is extended in my model by introducing the third, the conceptual dimension. I separate the mechanistic approach (biophysical) from the contextual or environmental (socio-psychological) approach, to account for the basic differences that were also pointed out by Bohm.

> The principal feature of [mechanistic] order is that the world is regarded as constituted of entities which are outside of each other . . . they exist independently in different regions of space (and time) and interact through forces that do not bring about any change in their essential natures. By contrast, in a living organism . . . each part grows in the context of the whole, so that it does not exist independently, nor . . . merely 'interacts' with the others, without itself being essentially affected in this relationship.[53]

The conceptual dimension accommodates Bohm's concept of knowledge incorporated in his contextual dimension as "an abstraction from the total flux . . . the ground both of reality and of our knowledge of this reality."[54]

The differences between his two--and my three--dimensional approaches are highlighted by Beagle's distinction between volumes (physical units, viewed mechanistically as collections of books in a library as a warehouse) and titles.

The concept combines the abstract content of books with their knowledge, "a collective interface between humans and an abstract aggregate . . . referred to as 'knowledge' or 'information'.[55] In my model, I distinguish between the physical carrier (volume), the human, contextual interaction, and the (Popperian) conceptual objective knowledge, the last two dimensions relate to Beagle's titles.[56]

## 10.5.4 Conceptual Level of Interpretation

### 10.5.4.1 Metaphysics of Information (Wright, 1977)

In the introduction to his study, Wright summarizes the argument that information can be a subject of philosophy, but not the object of science. He gives two reasons for his position: (a) information is a nonphysical entity, made up of spiritual structure and form, not of substance; and (b) the content of matter and "form, precisely qua form, cannot function as the direct object of science, which must have a physical referent (phenomenal base) in the material universe."[57]

Wright's argument is based on five assumptions, developed fully in his essay.

(1) The reasons and senses are completely different phenomena, and the human being is both: externally a material, sensory body, and internally a nonmaterial, thinking being. This distinction is reflected in the emergence of two basic philosophical systems, materialism, dealing with the nature and origin of the universe, and idealism, focusing on human life and conduct. Wright calls them mechus (materialistic, scientific), and telus (humanistic

idealistic) types of systems, which are synonymous with contemporary 'know-how' and 'know-what' approaches, respectively. Wright's main hypothesis is that librarians are idealists and librarianship is a metascience, since its subject matter derives "not from man and nature in an objective sense, but from human ideas, the human languages (both natural and artificial) and the human information processes."[58] He follows Kaplan (1964) in the assumption that philosophy can be based either on order, structure, and form, or on substance and content. Librarianship, according to Kaplan and Wright, is centered on the human mind.

(2) Man is an informational being, and a human information system is the only possible philosophical interpretation of everything in terms of human culture. The informational system may be sensory, neural, or noetic, cognitive. Human intelligence is capable of translating unstructured form into specific, manageable form "either by discerning or creating its material manifestations within the sensory ambience, or by manipulating its nonmaterial manifestations in some abstract system.[59] This dual capacity of intelligence results in (a) a dual kind of truth, experiential, artistic and intellectual, and scientific; (b) two kinds of thinking, inductive, empirical and deductive, and theoretical; and (c) two ways of learning and teaching, direct, experimental and indirect in abstraction.

(3) Abstract form differs from its expression. Form, according

to Plato, is the unexpressed, ideal, unchangeable pattern of things. Their ideal image is expressed in a communication system as a concrete but distorted material replica of that form. The distinction raised a philosophical question: "Does the unsensed world of form completely transcend the material world of senses (Plato), or is the former immanent within the latter (Aristotle)?"[60] The answers to that question reflect either the humanistic and metaphysical, or the scientific and empirical viewpoints. Corollary thoughts and language should be differentiated from their expressions. Likewise, information is a form, meaning 'in-for-mation,' that is, "the production of form in to 'inform' someone is quite literally to 'create form in' him, and the sensory modes of communication are both ancillary to that possibility and the means of its achievement."[61] This definition is contrasted with the interpretation of information by information scientists as a utilitarian, instrumental means toward some desired ends.

(4) Each form has informational properties. These properties serve as material means for expressing the ideas through two kinds of symbols: physical at rest, static, (e.g., writing) and physical in motion, kinetic (e.g., speech). The primary function of a kinetic symbol is to express sensory experiences and emotions, its secondary function is to reflect on them. The priorities are reversed in a static symbol, "which tends to filter out the instinctive and emotional elements of human express-

ion in order to display its neotic factors in permanent relationships."[64]

(5) Every society depends on its informational system, which, in the form of a generic book, stores information for future use.

Wright's metaphysical interpretation of information provides a conceptual dimension, which he further developed in his other writings. He argues strongly for a view of philosophy of librarianship which is based on a metaphysical distinction between empirical and conceptual approaches to the study of the field.

Wright has not yet published his overall philosophy of librarianship. However, the predominant theme in all his writings is the implications of the dichotomy between humanistic and scientific approaches to the study of reality. He distinguishes between the metaphysics of thought processes and their products on the one hand, and the physics of experienced existence, on the other.

In the course of the years of extensive writing on this duality he draws a sharp distinction between (a) information as the object of study incompatible with the scientific method (Wright, 1977); (b) psychophysical relationships between physical symbols and their symbolic referents (Wright, 1986); (c) artistic recognition of nonphysical structure and form and scientific description of physical substance and content (Wright, 1976-a); (d) the cultural idealism of individual cognition and cultural materialism of observable patterns of behavior (Wright, 1981-a);

(e) library substance (physical datum as a symbol) and its instruments (physical datum per se) (1979-a); and (f) a distinction between physical library operations and metaphysics of ideas about the reality (Wright, 1976-b).

Wright sees librarianship as an intellectual discipline studying knowledge itself, contrasted with empirical disciplines that use knowledge to study other things (Wright, 1984). It is not a subject-matter, but a way of finding subject-matters of interest to others (Wright, 1978). The focus in librarianship is on the communication of ideas, not on the transmission of signals (Wright, 1981-b).

Philosophy of librarianship, Wright argues, should be based on metaphysical beliefs about reality, epistemological explanations of these realities, and ethically determined actions in terms of these realities (Wright, 1982). It should reflect the holistic character of the discipline, its psychophysical unity of immaterial realities (ideas) with physical realities (data) (Wright, 1988). However, "librarianship is a metaphysical technology of knowing based on philosophy (knowledge of subsistents); it is not a physical technology of action based on science (knowledge of existents). Librarianship . . . is the very antithesis of science as a knowledge system." [63]

### 10.5.4.2 The Propositional Approach to Information (Fox, 1983)

Fox starts with a notion that 'information' in information science is identical with the ordinary understanding of the term. Furthermore, he limits his study to the linguistic conveyance of information, specifically to the information carried by sentence.

Before discussing his own approach, Fox reviews other theories of information, in the context of what information is not. Shannon's classical mathematical theory of communication (Shannon, 1948) is restricted to the transmission of messages, not their interpretations, and hence it is irrelevant to what is involved in the informing and misinforming processes. Fox rejects Wersig's and Neveling's (1975) definition of information as reduction of uncertainty in communication, since information can exist without being used in such processes. Whittemore's and Yovits' (1973) definition of information as 'data of value in decision-making' is equally unacceptable. It is a reductive analysis, defining one concept in terms of another, without defining either. Fairthorne's (1965) recommendation to stop using the term 'information' altogether is viewed as an argument of a nominalist who did not prove the unreality of the phenomenon for which the term 'information' stands. Schreider's (1965) focus is on the effect of information on the 'belief-state' of the receiver of communication ('thesaurus') This, to Fox is a "truism that a statement T conveys information to some individual if the individual understands T and changes his or her belief-state on the basis of T,"[64] without considering information content. And finally, Fox takes an objection to Belkin's and Robertson's (1976) concept of information as that which can change structured image or mental conception of what we perceive, without defining the notion of 'structure.' All the above examples, Fox argues, failed to represent the ordinary notion of information.

Fox's own approach to information treats of it in terms of a proposition..Although it is also a reductive analysis, a proposition is better understood than information; it expresses a certain viewpoint and is subject to truth verification. Hence information can be replaced by proposition: "any item or piece of information is (made up of) propositions."[65]

Proposition differs from both kinds of sentences, one standing for universals (e.g., yellowness), or describing instances of those universals (e.g., yellow). The former is refereed to as a 'type,' the latter as a 'token' sentence, and both are spatio-temporal entities. A proposition is neither. It is "what is asserted to be the case by (someone who writes or utters)" it. [66]

Furthermore, proposition is not identical with the basic meaning of the sentence. Meaning may have different connotations, "what is understood to be the meaning of a sentence . . . ['basic' meaning] . . . is very different from what a person means in using the sentence . . . ['extended' meaning]...and from what the sentence means . . . ['contextual' meaning]."[67] Only propositions, and not the meanings of the sentences, can be asserted to be true or false. The propositions are not the meanings of sentences, nor is information, although the meaning is more closely related to the latter. Fox realizes that the relationship between the two is not clear and is the subject of long-standing philosophical debate. He suggests, however, that part of that relationship is in the role that meaning performs as a mediator between sentences and propositions, "by virtue of which the former are able to express the latter."[68]

Subject to the above clarification, Fox offers what he calls "the propositional analysis of information," based on the assumption that "the information carried by a set $ of sentences is the proposition p, where p is a conglomerate proposition expressed by a set $' of sentences appropriately associated with $."[69] Both information and proposition are abstract, non-sentences, and identical, categories.

Fox admits the vagueness of the above definition but justifies it by a necessity to distinguish between information that may be contained in, transferred by, or conveyed to an individual by a sentence. The extend to which information may be contained in a sentence depends on the context in which the meaning of that sentence is used. Information transferred by sentences is always transferred to a specific individual. The extent of the transfer depends on that individual's interpretation of the information received. Furthermore, the information "conveyed to some individual is in part dependent upon the previous beliefs of that individual and on what that individual comes to believe as a result of receiving and understanding a message."[70] It depends on the extent to which the meaning of the content of the received information affected the belief-state of that individual.

The next part of Fox's model, not discussed here, focuses on the issues of informing and misinforming, "namely that X informs (or misinforms) Y that P only if Y receives and understands a message expressing the proposition that P."[71]

In final analyses, the nature of information is defined by the relationships between the characteristics of the following components in Fox model;

(a) information: "X informs Y that P only if X tells Y that P."[72]

(b) misinformation: "a truth condition will not have to be included in the analysis of 'inform,' while a falsity condition will have to be included in the analysis of 'missing form.'"[73]

(c) belief and truth: "belief is not essentially involved in the process of informing."[74]

(d) epistemic authority: "informing someone that P can only take place when the informant is in a position to know that P."[75]

Fox concluded that the model does not addresses the amount of information carried by sentences or its informativeness. Further studies are needed to better understand the impact of meaning on the propositional content within a given context and the nature of propositions themselves.

Fox's argument is an example of a conceptual analysis of semantic relationships between information and its carrier, the sentences.

> The job of providing a conceptual analysis has been characterized as a purely descriptive task: the aim is to discover and codify the rules that in fact govern our use of language . . . accomplished by advancing arguments based on various uses, or misuses, of certain terms . . . eliciting agreement on the use of language, and reaching philosophical conclusions."[76]

Nonverbal carriers (such as pictures, genes, electromagnetic impulses, etc.) are identified but excluded from Fox's study for the sake of simplicity. Hence, Fox indirectly connects his definition of information with what I call D3, data ascribed to the reality by human device, language. Electrical impulses and genes may be interpreted as D1, given, measurable data, while gestures and pictures as D2, perceived expressions of a given reality.

This narrow focus excludes consideration of data (or information) as process or event: information as proposition is not a temporal entity, occurring "at a particular time or over some duration of time."[77] It also excludes the notion of information as a commodity or product; a distinction is made between type of information (universal) and its instance (token), which merely "contains or conveys information."[78]

Fox's description of information approximates that of data viewed as phenomena. It "need not be true . . . believed by anyone . . . need not originate with a reliable informant, but it must originate with someone in an appropriate position to know."[79] And it is subject to specific circumstances (referred to by Fox as 'contextual factors'). The same information may be contained in more than one sentence, and its conveyance depends on the belief-state of the individuals involved, hence "the same set of sentences, used on a given occasion, may transfer different information to different individuals."[80]

## 10.6 The Concept of Continuity

A major characteristic of the redefined relationships among data, information, and knowledge is the continuity of these relations.

A notion that initially knowledge is a passive reflection of given facts stored in our memory as a part of knowledge acquired in the past implies that the thought process consists of two seemingly contradictory, simultaneous phases: (a) the passive stage, of knowledge already acquired, and (b) the changing state of knowledge prompted by active, innovative thoughts (Uchenko, 1929).

The unifying aspect of this process may be explained by a concept of hierarchy of changes, in which an active entity is changing within an unchangeable, passive larger entity at that moment. The changing aspects of the process may be metaphorically compared to a frozen action on the movie film's single frames; while a transition from one moment to another, called by Uchenko a 'continuity,' is a continuous movement created by a series of single exposures on a film.

We can also identify similar relations between sensory perceptions of new discrete facts or events and a simultaneous conceptual integration of those individual perceptions into an already developed unifying system of previously perceived facts or events in one's own mind. The formal phase of this data-information-knowledge process is referred to as a cognition of concrete particulars; the latter is named a cognition of universal abstractions.

In the diagram, data (D) are defined as perceptions of some concrete particulars, such as properties of objects, or events that are observed as changes in a given span of time, or records of such facts or events. The process of correlating two or more of these data is a part of integrated data-information-knowledge processes, while the result of such integration is a new relation known (K).

An integrated datum (I) is interpreted as an assertion of a given relation between two or more relevant data (D). The relationship between the two sets of integrated data (I1, and I2) changes the existing relations within continuously evolving total relations known. This interpretation follows Boulding's concept of an image 'build up as a result of all past experiences.'

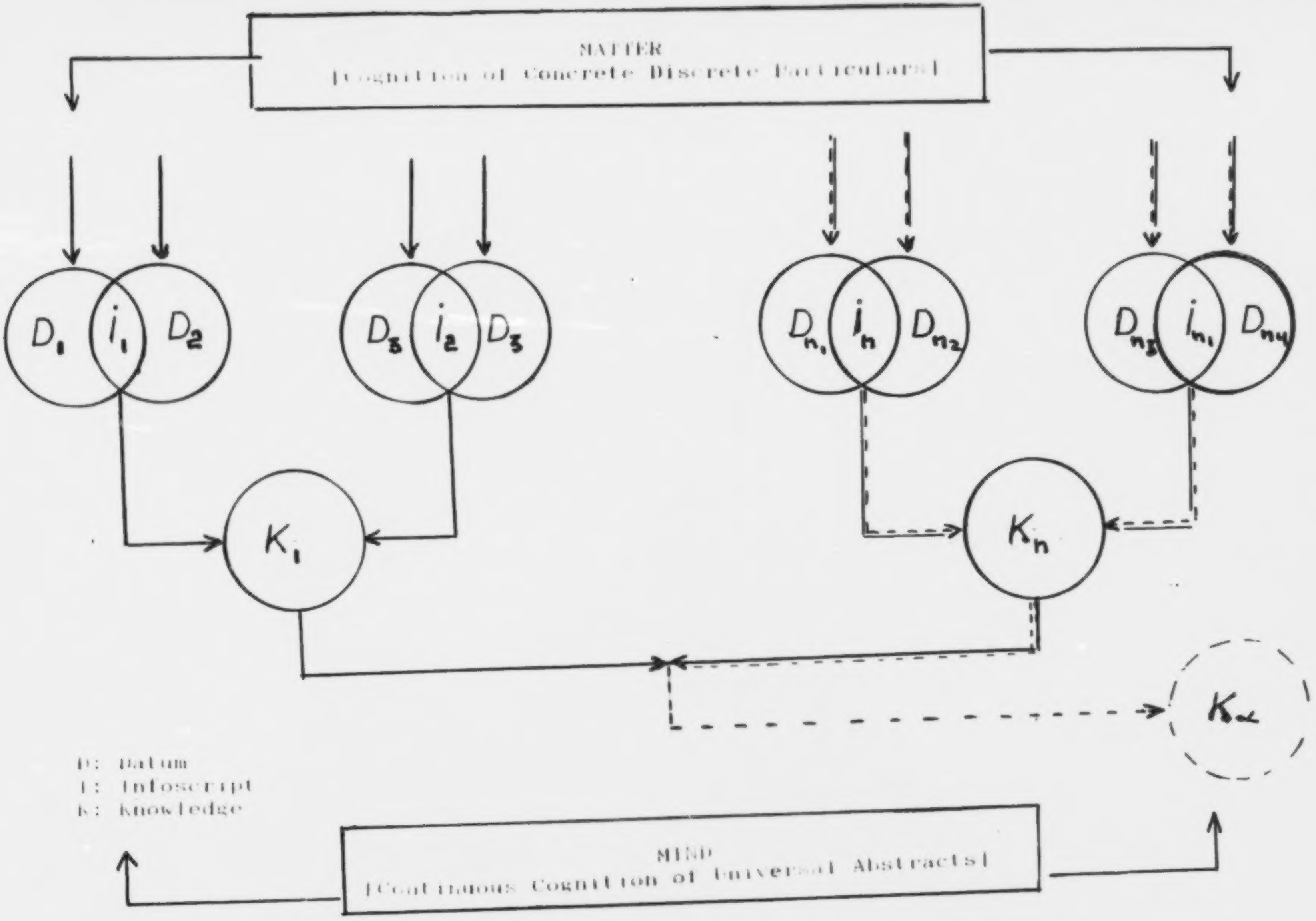
MATTER
[Cognition of Concrete Discrete Particulars]
$D_1$
$i_1$
$D_2$
$D_3$
$i_2$
$D_3$
$D_{n_1}$
$i_n$
$D_{n_2}$
$D_{n_3}$
$i_{n_1}$
$D_{n_4}$
$K_1$
$K_n$
$K_\alpha$
D: Datum
I: Infoscript
K: Knowledge
MIND
[Continuous Cognition of Universal Abstracts]

FIG. 10-3: RELATIONSHIPS BETWEEN DISCRETENESS AND CONTINUITY IN THE DATA - INFORMATION - TRANSFER [80]

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The relationships between discrete and continuous aspects of perception in the data-information-knowledge processes (d-i-k) can be described as a continuous merging of one phase of perception (sensory) into another (conceptual). The data-information sequences represent sensory perceptions of the concrete, external environment, the 'matter.'

An individual patron in a library, seeking information, is in fact looking for the discrete data about some specific aspects of that matter. Those data constitute building blocks in that patron's mind; the blocks of data are then interrelated within the previously acquired data. This stage of the data-information-knowledge process serves as a framework in which new perceptions are interrelated within a continuously changing state of relations known as a cognition of universal abstracts.

The above model reinforces the general notion of data-information-knowledge as a continuous process of integrating newly received perceptions into previously established systems of relations.

It is a transition from the passive state of knowledge, acquired in the past, to an active, newly formed state of relations (newly perceived ideas). The process consists of a continuous series of changing relations. The similarities among the data allow for the continuation of the process itself, while the differences in the relationships among them stimulate the changes in that process.

Three major levels of the continuum correspond to the three-dimensional concept of relations known. (a) At the empirical level, the continuum provides for a pattern of changes within an organism exemplifying the 'whole-part' relations, "so that the plan of the whole influences the very characters of the various subordinate organisms which enter into it" (Uchenko, 1929, p.145). (b) At the contextual level, the principle of continuity provides for a synthetic unity between two forms of changes within any organism: the preprogrammed, passively followed changes, and the original, actively initiated, creative changes of the organism. This synthesis provides uniformity of meaning in any culture; it is a kind of psychological reinforcement of a general social conformity and cultural stability of the larger organism which is unchanged at any particular moment. (c) At the conceptual level, the notion of continuity reflects the multiplicity of constantly changing interests of an individual, which brings the element of novelty into that individual's data-information-knowledge relationships, thus further stimulating the data-information-knowledge process itself. Therefore, the driving force in the d-i-k process at this level is human intellectual curiosity.

The empirical level of continuity provides for a unity of the process of changes in the 'whole-part' sense; the contextual aspect of continuity defines the condition for change, interpreted as a departure from the static, passive pattern; while the conceptual dimension of a continuum explains the reasons for the change (e.g., an intellectual curiosity, a novelty factor). Thus, continuity correlates various aspects of changing environment, reflecting the uniqueness of each individual member of that total environment. Similar concepts of data-information-knowledge processes are discussed by Otten (1970), Kochen (1969), Vinken (1982), and Bretz (1971).

According to those theories, information becomes a part of the human mind by a continuous interrelation of ideas identified and acquired empirically, described experimentally, and explained philosophically, each emphasizing a different aspect of the information-knowledge process.

### 10.6.1 Patterns of Communication

In a generally understood pattern of communication between an individual and the environment the relationship itself is discussed at two levels. (a) At the query level of inquiry-initiated activity, an individual queries a particular segment of the environment for specific data. (b) At the message level, an environment itself is considered as the originator of messages, responding to an individual's query.

The inquiry in the first stage, if made consciously, is determined by an individual's motivation for it, and the needs for data sought in terms of more or less clearly defined purpose for such an inquiry (e.g., 'why do I need certain data and what will I do with them, when I receive them?").

This model is not addressing an unconscious querying, that is, when a search for data is not defined, or when an inquirer is not actively seeking the data e.g., as in an exposure to an advertisement, although that aspect of the process can be incorporated into the second stage of the relationship.

The need-purpose of the query may be one of the three primary types. (a) The first of these is the search for a given single fact, series of facts, or events -- empirically identified, described, and measured ('factual data'). (b) The second consists of queries that are psychological in nature, engaging one's perceptive faculties in sizing up an environment. (c) And the third is a philosophical search for an explanation of a meaning of certain environmental manifestations (i.e., ideas or concepts about the environment).

Hence the first stage of the data-information-knowledge relations between an inquirer and environment can be symbolized as:

I-Q-E (Inquirer-Query-Environment) = Cognition of Concrete Particulars

In the second stage the environment yields data searched for by an inquirer. Those data are communicated in the form of messages sent by the environment and analyzed by a receiver of the message. This stage can be summarized as:

S-M-R (Sender-Message-Receiver) = Cognition of Universal
Abstraction

The two stages are connected by a feedback process, in which data received and absorbed in one's mind make an impact in turn on future individual-environment relationships.

The whole sequence is referred to as a data-information-knowledge process of searching for needed data and for incorporating them into new knowledge, by expanding or correcting the knowledge already possessed by an individual.

To summarize: the data-information-knowledge transfer involves three distinct phases: the inquirer's motivation, library's collection, and the inquirer's cognition of the content of selected records. The phases are connected by the query about the needed records, the message contained in them, and the feedback to the inquirer, either successfully completing the process, or continuing the search until needed records are located.

The query consists of three interrelated processes: (1) empirical inquiry about records (data), (2) psychological perception of the information contained in the record, and (3) philosophical cognition of its meaning.

The message of the selected record is contained in the record's carriers (commodity). As a datum, it is interpreted by the inquirer (behavioral reaction) as information, modifying his or her previous understanding of reality as new relations known (knowledge).

### 10.6.2 The impact of d-i-k Processes on Librarianship

The concept of data-information-processes may be useful to clarify some assumptions in the theory of librarianship, and to explain a changing focus in library practice.

A model is based on a distinction between the objective sphere of matter, existing outside of the human mind, and a subjective sphere of perception of that matter by individual human beings in the form of thoughts about that matter.

The process itself is relational, and it provides a mental link between the physical, real world, and a metaphysical world of ideas. In this sense, the continuity of the data-information-knowledge processes explains, at least in part, the dichotomy between the constantly changing content of recorded messages, and a relatively unchangeable structure of the communication process itself. That is, the ideas about the matter 'out there' change, but the mechanism for their development remains the same. This model does not imply a form-content separation, it de-emphasizes that distinction. Form and content "are complementary terms: they have no meaning in isolation. But in conjunction they make up the meaningful form-content relation . . . The very essence of form is to be imposed on content, whereas the very essence of content is to be subject to form.'[82]

This important point is often overlooked by the critics of metaphysical approaches to the theory of librarianship. The opposition between form and content 'is not equivalent to the dualism of the ideal and the real . . . [but it is] functional and relative to a certain context . . . in a different context a term which used to be a form may turn out to be a content.'[83]

Fig. 10-4 summarizes Uchenko's eloquent discussion of the form-content relations. The focus on either the form or a content in librarianship affects the approaches of the users of library material. It is not an issue of building separate theories for ideal and real worlds, since both, form and content, reflect each of the two worlds. In the context of a material world, the form is represented by empirically described data, while the content of those data is expressed by scientifically described relations between those data and their explanations. In the context of ideas, the form is made of individual thoughts, interrelated in an abstract universe of a philosophical discourse.

In both, the emotive aesthetic and the experimental scientific data-information-knowledge processes, the content of the process is determined by the form of a particular medium of expression, or by the message contained in the carrier of information. In the philosophical, reflective data-information-knowledge process, it is the form, the platonic essence, that is expressed by various content manifestations.

| APPROACH | FORM | CONTENT |
|---|---|---|
| EMOTIVE<br>'IRRATIONAL'<br>e.g.,<br>ESTHETICS | FORM OF EXPRESSION<br>(e.g., style of writing)<br>↖ ← | CONTENT OF THE MESSAGE<br>(e.g., plot of a story)<br>← EXPRESSED BY: |
| REFLECTIVE<br>'RATIONAL'<br>e.g.,<br>PHILOSOPHICAL | ESSENCE OF REALITY<br>(e.g., platonic idea)<br>EXPRESSED BY: → | MANIFESTATION OF EXISTENCE<br>(e.g., empirical matter)<br>→ ↗ |
| DESCRIPTIVE<br>'EXPERIMENTAL'<br>e.g.,<br>SCIENTIFIC | CARRIER OF INFORMATION<br>(e g., printed report)<br>↖ ← | MESSAGE OF INFORMATION<br>(e.g., compilation of data)<br>← EXPRESSED BY: |

FIG. 2 FORM - CONTENT INTERRELATIONS [84]

The model of the data-information-knowledge process may also contribute to a better understanding of the conditions necessary for the fulfilment of the library mission to assist the patron in obtaining needed material.

As the model suggests, personal knowledge is subjective, always directly related to an individual's own previous knowledge and unique way of absorbing new perceptions into an existing system of relations already known. As I have said at the beginning of this chapter, all that the library can do is to provide its patron with the records available in the library collection. It is up to individual users of that collection to relate the content of the retrieved material to their own needs. Hence, the role of a librarian is to provide an environment required by patrons for their own data-information-knowledge process.

For those reasons, the traditional reference function of providing specific answers to more or less specific questions must be expanded to allow users to develop their own thoughts rather than merely to familiarize themselves with the thoughts of others.

Librarians qua librarians will have to expand their role as consultants by evaluating the quality of the text given to the patron. The issue is avoided by librarians now in order not to prejudice library patrons.

This brings up even more complex issue of cognitive authority, viewed by Wilson in terms of professional skeptics questioning the quality of the material claims to knowledge, without declaring their own preference (Wilson, 1983).

In the final analysis it is a personal knowledge that matters in librarianship, a knowledge that is defined as a subjective, ever-changing state of mind, a result of continuous personal data-information-knowledge processes. The practical consequences of subscribing to the concept of continuous information-knowledge processes are evident in a newly emerging emphasis on the process of making library material available to the user.

It is a shift in emphasis from a concentration on collection of physical carriers of information and knowledge to a more aggressive development of the intellectual access to these collections. This change is evident in the emphasis on resource-sharing and network approaches to library collections and services.

Modern librarianship goes beyond the task of arranging and classifying the library material; it also develops methods of relating the content. A phenomenal expansion of information retrieval services and the role of the computer will have enormous impact on librarianship in its capacity to interrelate various recorded data-information-knowledge processes to meet the unique needs of individual patrons.

The stereotypes of a material- or user-oriented librarian will merge into those of data-information-knowledge process-oriented consultant. The reality of the material world is existential in nature. Its perception is selective and subjective, responding to external stimulation, or it is initiated by one's own intellectual curiosity. Its comprehension is always relative to previously absorbed perceptions, interwoven into a system of personal relations known at any one time. This is the essence of the data-information-knowledge continuum, the major component of the metalibrary intellectual environment.

## NOTES

1. Roszak, Theodore (1986). *The Cult of Information*. The Folklore of Computers and the True Art of Thinking. New York: Pantheon Books, p. 13.

2. Wellisch, H. (July 1972). "From Information Science to Informatics: A Terminological Investigation." *Journal of Librarianship*, 4(3), p. 171.

3. Schrader, A. M. (1983). *Toward a Theory of Library and Information Science*. Unpublished doctoral dissertation, Indiana University, Bloomington, Indiana, p. 110.

4. Hayes, R. M. (1969). "Information Science in Librarianship." *Libri*, 19(3), p. 218.

5. Ibid., p. 220.

6. Ibid., p. 217.

7. Diener, R. A. (Jun-Jul, 1989). "Information Science: What It Is? . . . What Should It Be?" *Bulletin of the American Society for Information Science*, 15(5), p. 17.

8. Nitecki, J. Z. (Fall 1985). "The Concept of Information-Knowledge Continuum: Implications for Librarianship." *The Journal of Library History, Philosophy and Comparative Librarianship*, 20(4), p. 392.

9. Belkin, N. J. (March 1978). "Information Concepts for Information Science." *Journal of Documentation*, 34(1), pp. 82-83.

10. All definitions and synonyms of 'information' (both nouns and adjectives) cited below are quoted from Schrader (1983), pp. 111-116, as examples of different attributes of data.

11. Some definitions are here adapted from the *Dictionary of Psychology*. ed. H.C. Warren. Boston: Houghton, Mifflin Company, 1934; from *Dictionary of Philosophy*. ed. D.D. Runes, New York: Philosophical Library, 1983; and *The Encyclopedia of Philosophy*. ed P. Edwards, New York: Mac-

millan Publishing Co., 1967.

12. Best, D. P. (1988) "The Future of Information Management." *International Journal of Information Management*, v. 8, p. 14.

13. Belkin, N. J., and Stephen E. Robertson, (July-August, 1976). "Information Science and the Phenomenon of Information." *Journal of American Society for Information Science*, 27(4), p. 201.

14. Shannon, C. E., and Warren Weaver, (1964). *The Mathematical Theory of Communication*. Urbana, Ill: The University of Illinois Press, p. 10.

15. Wersig G., and Ulrich Neveling (1975). "The Phenomena of Interest to Information Science." *Information Science*, v. 9, p. 132.

16. Debons, A. (November 1978). *Determining Information Functions*. Discussion Paper, NSF Manpower Survey Project DS1-7727115, p. 2.

17. Pratt, A. D. (1982). *The Information of the Image*. Norwood, N.J.: Ablex Publishing Corporation, p. 35.

18. Fairthorne, R. A. (1965). "'Use' and 'Mention' in the Information Science." In Laurence Heilprin (ed.), *Proceedings of the Symposium on Education for Information Science*. Washington, D.C.: Spartan Books, p. 10.

19. Wersig, G. and Urlich Neveling (1975), op. cit.

20. The essays were arbitrarily selected as illustrations for the model suggested in this paper. None, of course, was written with this model in mind, and therefore the quotations extracted from them may be out of intended context. However, as quoted, they provide good examples for the infoscriptive processes suggested in the model.

21. Otten, K. W. (1974). "Basis for a Science of Information." In A. Debons (ed.), *Information Science; Search for Identity*. Marcel Dekker, p. 95.

22. Ibid., p. 96.

23. Horowitz, R. G. de (1988). *Librarianship; A Third World Perspective*. New York: Greenwood Press, p. 50.

24. Ibid., p. 118.

25. Ibid., p. 114.

26. Ibid., p. 117.

27. Ibid., p. 94.

28. Young, P. (1987). *The Nature of Information*. New York: Praeger. p. 52.

29. Ibid., p. 61.

30. Ibid., p. 66

31. Ibid., p. 80.

32. Ibid., p. 52.

33. Ibid., p. 33.

34. Ibid., p. 46.

35. Ibid., p. 99.

36. Ibid., p. 34.

37. Ibid., p. 55.

38. Ibid., p. 75.

39. Ibid., p. 43.

40. Ibid., p. 47-48

41. Ibid., p. 1-2.

42. Ibid., p. 77.

43. Stonier, T. (1991). "Towards a New Theory of Information." *Journal of Information Science*, 17, p. 257.

44. Ibid., p. 258.

45. Ibid., p. 262.

46. Smalley, T. N., and S. H. Plum (1982). "Teaching Library Researching in the Humanities and the Sciences: A Contextual Approach." In C. Oberman, & K. Strauch (ed.), *Theories of Bibliographic Education*. New York: R. R. Bowker, p. 138-139.

47. Ibid., p. 138.

48. Ibid.

49. Ibid., pp. 138-139.

50. Ibid., p. 141.

51. Ibid., p .158.

52. The concept of wholeness is defined by Bohm as the implicate order of the holomovement, "a multidimensional reality whose totality is immeasurable and undefinable because we ourselves and our processes of knowing are enfolded within it." Beagle, D. (March 1988). "Libraries and the 'Implicate Order': A Contextual Approach to Theory." *Libri*, 38(1), p. 33.

53. Bohm, D. (1980). *Wholeness and the Implicate Order*. London: Ark Paperbacks, p. 173. (also quoted by Beagle, 1988, pp. 32-33).

54. Beagle, 1988, op. cit., p. 31.

55. Ibid., p. 34.

56. Note also his comment on the use of nouns and verbs in definitions of information. "The fact that we thus use nouns to name actions or processes more appropriately described by verbs may partly explain why such nouns have proven resistant to unambiguous definition" (Beagle, 1988, pp. 31-32).

57. Wright, H. Curtis (1977). *The Oral Antecedents of Greek Librarianship*. Provo, Utah: Brigham Young University Press. Foreword by Jesse H. Shera; Afterword by H. J. de Vleeschauwer, p. xv.

58. Ibid., p. 9.

59. Ibid., p. 11.

60. Ibid., p. 23.

61. Ibid., p. 31.

62. Ibid., p. 34.

63. Wright, H.Curtis. "The Wrong Way to Go." *Journal of American Society for Information Science*, 30(2). March, 1979, p. 74.

64. Fox, C. J. (1983). *Information and Misinformation; An Investigation of the Notions of Information, Misinformation, Informing and Misinforming*. Westport, Conn.: Greenwood Press, p. 70.

65. Ibid., p. 91.

66. Ibid., p. 77.

67. Ibid., p. 83.

68. Ibid., p. 96.

69. Ibid., p. 98.

70. Ibid., p. 102.

71. Ibid., p. 109.

72. Ibid., p. 116.

73. Ibid., p. 160.

74. Ibid., p. 168.

75. Ibid., p. 179.

76. Ibid., p. 25.

77. Ibid., p. 31.

78. Ibid., p. 34.

79. Ibid., p. 212.

80. Ibid. p. 101.

81. Nitecki, 1985, op. cit. , p. 394.

82. Uchenko, A. P. (1969). The Logic of Events; An Introduction to a Philosophy of Time. In G. P. Adams et al. (ed.), *University of California Publications in Philosophy.* New York: Johnson Reprint Corporation, p. 73.

83. Ibid.

84. Nitecki, 1985, op. cit., p. 400.

# CHAPTER 11:
# THEORY OF METALIBRARIANSHIP

## 11.1 Theory and Metatheory

### 11.1.1 The Purpose of the Theory

The purpose of the theory is to contribute to better understanding of relationships within the field. On the one hand, there is a need to clarify the relationships between the physical collection of a variety of records stored and served in the library and the formal, passive, and detached theory of librarianship. On the other hand, the theory in librarianship must relate to the subjective, dynamic, and personal involvement of library users. This relationship implies the existence of a potential knowledge embodied in librarianship, expressed in this book as a conceptual theory of librarianship. I consider librarianship as a discipline which includes all issues related to recorded knowledge and information.

The relational approach to the theory of librarianship has been anticipated in various forms before: Wellard (1934) distinguished between three approaches to philosophy of librarianship: (a) the factual or scientific, (b) the inductive or philosophical, and (c) practical approach based on expediency and assumptions. Miller (1936) warned about a too-narrow theory of librarianship built exclusively around the concept of the library, and proposed a twofold 'book-reader' approach. Predeek (1939) over stressed the cultural factor by viewing the library as a protagonist of specific cultural values of citizenship and democracy. Bergen (1963) focused on integrating teacher-librarian functions.

The present study expands the above division of the field by rejecting a clean-cut Wellard's distinction between the scientific and philosophical approaches, proposing instead an all-inclusive, relational approach that interrelates different theories in a single model, each theory accounting for different aspects or analysis of 'facts.' The model further expands the subject matter of librarianship beyond Miller's 'book-mindness,' by placing the model in a broadly defined intellectual environment. It considers Predeek's 'cultural values' as one of many attributes of knowledge, defining the term 'knowledge' not as an ideal aimed at, but as a totality of 'relations known,' already existing either in the records available in library collections or in the minds of the users of these records. And finally, the model differs from Bergen's teacher-librarian's merger by distinguishing between these two interdisciplinary relationships, thus acknowledging an independence of metalibrarianship from education.

### 11.1.2 Metatheory

Metatheory focuses on basic properties of a system. Based on logical analysis it develops theorems about a given system, rather than the theorem of, or within, the system itself.

Extended to the disciplines at large, metatheories form the bases for metasciences. Of particular interest in this book are the metascientific approaches to library and information science. In information science, metascience consists of "simplifying and unifying theories that subsume the main concepts of the original theories"[1] providing the foundations for the discipline. Its main purposes, according to Otten and Debons, are to provide descriptions of common bases and a common language for communicating and translating scientific findings between different sciences. They call it 'informatology' a science of information that studies "the fundamental principles underlying the structure and the use of information."[2]

In librarianship, Kaplan defines metasciences as a basis for intellectual foundations in library science, which are "not about subject matters provided by man and nature, but about subject matters provided fundamentally by our ideas about man and nature, or by our language, or by our ways of transmitting and processing the information."[3]

### 11.1.3 Meta-Library and Information Science

The primary function of both library and information sciences is to facilitate transfer of information from the source to its destination. The 'stuff' of the transfer in library science is the content of a record; in information science, it is often an undefined, energylike force. Consequently, the library processes consist of acquisition, organization, and dissemination of data, information, or knowledge in recorded formats; in information science the processes relate to the storage, retrieval, and dissemination of information itself.

The primary objective of library science is "to take the substantive problems of libraries and librarianship and apply to them the research methods that seem appropriate from other disciplines."[4] In information science, the subject matter is "processes, methods, and laws related to the recording, analytical-synthetical processing, storage, and dissemination of scientific information, but not the scientific information as such, which is the attribute to a respective science or discipline."[5]

Taylor's added-value theory provides a link between the record-service oriented approach of library science and information-process oriented information science. The model consists of "a formal system made of specific processes which add value to items being processed; user or sets of users, who . . . have certain problems which establish criteria for judging the utility of the system's output; [and] a negotiation space between system and users, where the system displays its output and the values accumulated through the system to assist users in making choices."[6] Thus the model interrelates the user with the information processes. The interrelationship is in a form of advantages ('values added') of a given system for a particular user's criteria of choice.[7]

## 11.2 Metalibrarianship.

One of the dimensions of growth is its complexity. The bigger or older the institution, the more intricate its organization, the more elaborate its goals, and the more involved its ways of meeting these goals. This principle applies to librarianship, whether it is considered a discipline, an institution, or a service. Librarianship is here interpreted as a general discipline, and its essential characteristics are studied as a whole, with library and information sciences considered as sub-disciplines of the same basic philosophical approach. The two sub-disciplines merge in the unified theory.[5]

I call this all-inclusive intellectual discipline a metalibrarianship. Its basic components are derived by reducing the complexity of the field into its simplest parts, the 'roots' of that discipline. Since the complexity encompasses more than just the structure of physical library facilities, the term 'roots' refers not to empirically verified facts or measurable entities, but rather to the relationships between these facts or entities and their interpretations. Thus, the general concept of metalibrarianship is here defined as an interpretation of a discipline: the study of relationships between three primary elements in the process of transforming data, through information into knowledge (d-i-k transfer): (1) the participant in the transfer, the user or reader of the document (alpha), (2) its content or subject matter (beta), and (3) the carrier of the description (a generic book, gamma).

All these relations are considered simultaneously at three levels (a) procedural (Pd), describing an actual process of information transfer (d-i-k); (b) contextual (Cx), identifying the impact of environment on that process; and (c) conceptual (Co), defining its meaning to the participant in the process. The definition of metalibrarianship becomes more technical later in this book, reflecting a more detailed study of relationships involved at different levels of analysis. [9]

### 11.2.1 Methodology

The objective of methodology in this book is to develop a model for interrelating the relationships between the message contained in the record and the interpretation of its meaning by the receiver of that message.

The proposed model translates the meaning imbedded in these semantic relationships into specific library environment. The interpretation provided by the model is metaphysical, focusing on the essence of the relationships, while the approach is metaphorical, reflecting subjective perception of reality.

The process is modeled on the methodology of the metamathematical study of relations between the logical, formal expressions and the objects they denote.

### 11.2.2 Geometric Method: Evolution of the Concepts

Mathematical method is based on logical deductions of theorems from sets of undefined properties, functions, or relations and from unproved propositions about them, called axioms or postulates. The theorems refer to variable values represented by these postulates. The definitions of mathematical terms and their analysis follow logical principles.[10]

Both algebra and geometry are deductive disciplines; both deduce certain properties or relations from predefined conditions. Philosophically, both approaches are similar. Historically, Euclidean geometry was founded on the axiomatic method of accepting without proof certain properties or relations. Today, both disciplines are joined by the axiomatic method, although the geometrical approach tends to emphasize spatial relations, while algebra focuses on set theory. In a non-mathematical interpretation, the geometrical method offers, illustrations of metaphorical relations which are easier to visualize.

The origin of geometry and of many important theoretical concepts goes back to ancient Egyptian surveyors of the Nile, who developed empirical generalizations about the lines, angles, and figures used in their surveying operations (the concept of graphic symbols).

Greeks selected some of the Egyptian generalizations as basic laws, deducting new laws from them by means of logic, (the concept of deductive reasoning). Pythagoras (572-497 B.C.) organized new abstract concepts in a systematic order (the concept of a theoretical science), and Plato (387 B.C.) related abstract and timeless aspects of geometry to metaphysics (the concept of metaphysical deductions and a priori forms).

Euclid (*Elements*, 300 B.C.) introduced synthetic geometry based on five unproved principles and five unproved axioms about these principles through rational insight and a synthetic a priori knowledge (the concept of axioms).

Descartes (*Geometry*, 1637), the father of analytical geometry, proposed that problems can be resolved by breaking them into constituent ideas ('coordinates'). Nothing should be accepted as true until there is no doubt about it (the concept of heuristic, analytical method).

Lobachevsky (c. 1825) and others established validity for a hyperbolic geometry with Euclid's parallel postulate, by replacing one of Euclid's axiom with its negation (the concept of non-Euclidean geometry).

Frege (1879) developed, independently of Boole, symbolic, or mathematical, logic, by using formalized logical language or calculus to avoid ambiguities of ordinary language. He made a distinction between the name of the formula and the formula itself, establishing a notion of a formal, logical system as an accepted standard of precision in the foundations of mathematics.

Hilbert (1899) has proven the consistency of a system without assuming consistency of another system. He introduced the complete formalization of a deductive system by eliminating any meaning from its signs, called calculus. However, the relationships between these meaningless signs can be meaningful in meta-mathematical statements "about the signs occurring within a formalized mathematical system."[11] Hilbert's proof of consistency is a meta-mathematical axiomatization: a process of abstracting some fundamental relations from the intuitive meaning of a term. These relational structures are taken to be the immediate objects of the axiomatic theory. The approach is not considered as a system of statements about a subject matter, but as a system of conditions for the relational structures. The axioms impose the conditions on the relations themselves. This approach is useful in natural sciences, where individual relations are interpreted in terms of their axioms.[12] Einstein's relativity theory implies changing behavior of a straight line that is bent by gravitation (Einstein, 1920). Hence, the mathematical laws applied to real situations are not certain (the concept of relativity of any model).

Godel (1931) identified certain inherent limitations of the axiomatic method by proving that it is impossible to formalize a consistency proof for a logical system within itself. In any formal system there is at least one formula whose existence or non-existence cannot be proven.

This theorem questioned Frege's notion that a formal logical system is an accepted standard of precision in the foundations of mathematics. Furthermore, it implies that human knowledge cannot be exclusively based on a deductive system. Consequently, computers, instructed by "fixed rules of inference of formalized axiomatic procedure," will never be able to solve all the problems.[13]

Godel's incompleteness theorem shows that "there are innumerable problems in elementary number theory that fall outside the scope of a fixed axiomatic method."[14]

In other disciplines, dealing with more finite systems far removed from rigid mathematical formalization, the problem of consistency is less severe. It can, when needed, be dealt with by similar method of meta-analyses about their own logical systems.

Godel admitted that although his incompleteness theorem challenges the claim to absolute consistency of mathematical model, there is a possibility that "classes and concepts may . . . be conceived as real objects . . . existing independently of our definitions and constructions."[15]

This statement resembles Platonic realism, which maintains that mathematical concepts, e.g., a triangular shape of a physical body, exist not in the spatio-temporal universe, but as "merely imperfect embodiments of an indivisible 'perfect' triangle . . . and can be grasped solely by the exploring mind of the mathematician."[16]

Indirectly, the above statement relates to the notion of intuitive knowledge. Here, 'intuition' does not mean an unjustified 'hunch' or a mystical experience, but a Kantian notion of direct relations with an object, prior to mediation or judgment about it. This is similar to Russell's distinction between immediate "knowledge by acquaintance" and mediated "knowledge by description" of the facts related to that object.

This kind of knowledge is not a criterion for determining the truth of statements or observations, but merely an intuitive sensing of the possible existence of other relations.

This very sketchy review of the history of meta-mathematical methodology provides some encouragement for a metaphysical approach in my own model in the use of graphic symbols, metaphysical deductions, and a priori forms, axioms, heuristic methods, and the distinction between knowledge by acquaintance and by description.

### 11.2.3 The Triadic Concept: 'Tria Juncta in Uno'

A comparison of two concepts related to each other in terms of the similarity or difference between them is interrelated by the third concept which modifies the relations by either weakening or strengthening it. In a binary system 'either a or b' requires the third component, c, which specifies the environment of the binary relation, such as 'a & b' or 'a not b' under given condition, c. In Hegelian dialectics the opposite views must be linked by the third view in order to be meaningful; for example, something is either true or false, but only in a defined situation.

Thus the third element in a triadic relationship provides a link between common denominators of the other two elements. It serves as a reference point for the binary relations.

The three-dimensionality of the model summarizes information input, visualizes it, and provides a comprehensive view of the situation as a whole (gestalt). Usually, the human mind absorbs new ideas through visual presentation, which organizes information into patterns that match the familiar and visual three-dimensionality of the real world. Neurologically, patterns are received by the right hemisphere of the brain; if new information input disturbs the existing pattern, it is first analyzed by the left side of the brain, before modifying the existing knowledge pattern (Lee, 1985).

### 11.2.4 Heuristic Value of the Triadic Approach

Barantsev offers philosophical endorsement of the value of the triadic approach. As he pointed out, the triad represents a unity of rational, emotional, and intuitive modes of thoughts, combining elementness, relatedness, and wholeness of any relations.

It offers a synthetic definition of relations within any system by combining its analytical, qualitative, and substantial elements. "The presence of an additional parameter (mediator, agent) seems to be indispensable for the reconciliation of antitheses and attainment of an integral unity." [17] By reducing triadic relations to a binary of opposites, one weakens the correlative aspects of the relational wholeness.

The general concept of a 'system' implies a triadic reconciliation of contradictions between the parts and the whole via relations. For example, "books (and not only books) should be estimated by induced associations no less than by the amount of information and intensity of emotions. Similarly, when defining conceptual bases of physics we draw the conclusion, in the light of the system triad, that the concepts of substance and field should be supplemented by the equally fundamental concept of force."[18]

The triadic approach is subject to the threefold test of: (1) compatibility with other acceptable models of Library and Information Science; (2) consistency with actual library experiences; and (3) conduciveness toward a goal of identifying common denominators in a variety of d-i-k transfer.[19]

### 11.2.5 Assumptions

The model developed in this book is based on a series of provisional assumptions about the nature of metalibrarianship, and each assumption or hypothesis describes different sets of relationships.

#### a. Metaphysical Assumptions:

The essence of metalibrarianship is expressed symbolically in terms of basic relationships between carriers of information (gamma, e.g., recorded data), and their meaning (beta, i.e., the content of recorded messages) as interpreted by their receiver (alpha, e.g., a reader of the book). The relationships are here discussed metaphysically. Each metaphysical theory is based on some conceptual metaphors, describing the relational analogy between the multivaried meanings of any concept and their interpretations, formulated from different perspectives.

Metaphors offer an insight into the metaphysical reality by expanding its previous relations into new interpretations.

### b. Epistemological Assumptions

The origin, structure, methods, and validity of knowledge can be discussed at different levels (world hypotheses), each level reflecting different basic assumptions (root-metaphors) on which a particular viewpoint is based. Since metalibrarianship is an all-inclusive discipline, it must be open to all known approaches to knowledge within a given system.

### c. Logical Assumptions

Metalibrarianship is perceived as a set of concepts (a system) that interrelates users' needs for information with the means available to them to obtain that information.

What is essential is the relationship between the basic concepts, not the specific properties of these concepts. The relationships are analyzed on the two already-mentioned levels: (a) internal relationships between alpha, beta, and gamma, in their static and dynamic stages; and (b) external relationships between different sets of alpha-beta-gamma within the three types of reality: (1) procedural, physical, observable (Pd), (2) contextual, observable, cultural (Cx), and (3) conceptual, deductive, logical (Co).

## 11.3 Hypotheses

### 11.3.1 World Hypotheses

My model, initially outlined in my 1963 master's paper, is based on Pepper's concept of world hypotheses, and it resembles to some extent Popper's model as described by him in 1979 essay. Pepper identified five major world hypotheses: mechanism, formism, contextualism, organicism, and selectivism. The root-metaphors of the last two world hypotheses are incorporated in my study in contextualism. In my model organicism, the integration, by virtue of explaining away the time element from its contextualistic formulation, is a part of a 'historical event,' of contextualism. Selectivism relates to the purpose and self-regulating act, in what A. N. Whitehead calls 'actual occasion, ' and is also interpreted in our definition of contextualism.[20]

In the table below (Fig. 11-1), the three world hypotheses are described in terms of (a) the theories of reality in Pepper's hypothesis, (b) the nature of their perception in Popper's formulation and (c) kinds of interpretation in metalibrarianship. The corresponding root-metaphors reflect different ways of seeing these realities; as phenomena by Pepper, as states by Popper, and as changes in metalibrarianship. Consequently, the basic relationships within each hypothesis differ. Pepper focuses on logical interpretation of perceived facts; Popper emphasizes the relationships between real and thought products; while in metalibrarianship the meaning of relations among means, ends, is central.[21]

| HYPOTHESIS | REALITY | ROOT-METAPHORS | FOCUS ON |
|---|---|---|---|
| a. Pepper's | | | |
| -Mechanism | -Naturalism | -Machine | -Facts |
| -Contextualism | -Pragmatism | -Historical event | -Perception |
| -Formism | -Platonic idealism | -Similarity | -Logic |
| -Organicism | -Absolute Idealism | -Integration | -Appearance |
| b. Popper's | | | |
| -World 1 | -Physical | -Physical states | -Real objects |
| -World 2 | -Subjective | -Mental states | -Thought |
| -World 3 | -Objective | -Intelligible | -Product |
| c. Metalibrary's | | | |
| -Proceduralism | -Empirical | -Process | -Means-ends |
| -Contextualism | -Pragmatic | -Product | -Goals |
| -Conceptualism | -Rational | -Relations | -Meaning |

Fig. 11-1: Interpretation of Primitive Terms
in World Hypotheses

In a broad sense, World 1 resembles our proceduralism, World 2 contextualism, and World 3 conceptualism. The major difference between the two approaches is in the purposes of each classification. Popper uses it to delineate three separate realities; we consider the division as three different levels of interpreting Popper's realities. Thus, e.g., each of Popper's worlds, World 1, World 2, or World 3, can be interpreted procedurally, contextually, or conceptually.

### 11.3.2 Metalibrary Hypotheses

Three questions are of importance in metalibrarianship. (a) What is the knowledge sought, i.e., what are the patron's needs for information? (b) What types of material best match these needs? and (c) What are the relationships between types of materials needed by patrons and the role of librarians in that process?

The approach is based on the distinction between three types of realities: (1) observable, physical, (2) observable, cultural and (3) reasoned, logical. [Fig. 11-2] All types of reality are contained in three types of records: data (d), information, i.e., clusters of infoscripts (i), and knowledge (k), together constituting the metalibrary subject matters (d-i-k transfer). Individually, each reality is interpreted in terms of its own processes, environments, and meanings.

Metalibrarianship is an interdisciplinary field incorporating some aspects of (1) natural sciences (e.g., in the arrangement and organization of library records), (2) social sciences (in areas of access to, and service of, collection records), and (3) abstract sciences providing methods for interrelating above approaches (e.g., planning library organization and services).

### 11.3.3 Levels of Interpreting Library Reality

| RELATIONS | REALITIES | | | |
|---|---|---|---|---|
| | Observable Physical | Observable Cultural | Deductive Logical | Metalibrary Interpretation |
| Processes | Natural Sciences | External sense perception | Empirical Verification | Bibliographic Organization [Pd] |
| Environments | Social Sciences | Individual Society | Existential Behavior | Contextual Environment [Cx] |
| Meanings | Abstract Sciences | Intellectual Systems | Essential Relations | Conceptual Interpretation [Co] |

Fig. 11-2: Interdependence among the three types of realities and metalibrarianship

As illustrated in Fig. 11-2, the reality of metalibrarianship is a metaphorical relationship between the three realities, physical, cultural, and logical. On the procedural, empirical level (Pd) it consists of bibliographic organization of communication carriers such as books, films, or tapes. On the contextual level (Cx), the reality is considered in terms of the content of the communication carriers, in which the meaning contained in the carriers is interpreted within a given environment. On the conceptual level (Co), the meaning of each reality is interpreted in terms of the existing records describing different aspects of reality.

The empirical reality of librarianship is expressed in library operations; the contextual, sociological reality refers to the subject content of a library collection; while conceptual, philosophical reality defined the library's basic function as a disseminator of the acquired and organized knowledge.

The three realities are deliberately juxtaposed between the two kinds of meanings: one expressing some established concept of reality, the other providing interpretation in accordance with the way it was experienced at the time. Together the two meanings suggest a new insight into the nature of reality. For example, the juxtaposition between the empirical and fictional concepts of reality with their objective or subjective interpretation may contradict the initial experience of a given reality by an individual; this produces a tension, which, in turn becomes an impetus for expanding the individual's knowledge by absorbing novel relationships in his or her constantly changing knowledge of reality.

All three types of realities influence library operations, its environment, and the definition of the very meaning of the discipline. As indicated in Table 11-2 above, library processes involve physical records (book and nonbook formats), their content (across the spectrum of knowledge from scientific dissertations to the most practical manuals), and logical verification of the processes themselves (e.g., in determining the degree of relevance of library service). Similarly, the library environment, described within social sciences, involves individuals and their communities and is reflected in a variety of individual and group behavior. The meaning or the rationale for library existence is a subject for a dialogue in abstract sciences (dealing, for example, with the philosophical issues) about LS as an intellectual system (describing different levels of educational backgrounds and needs of its patrons), and it is defined in terms of basic relations between primary components of the discipline.

The study of the relationships between alpha, beta, and gamma is conducted on three different levels in order to consider the three basic functions of the library. (a) The procurement of factual material for specific needs is determined by observable characteristics of the informational function of the library. (b) The diffusion of knowledge is defined in terms of similarities between the available records and the expected information. (c) Servicing individual patrons' informational needs is determined by the impact of alpha-beta-gamma relationships on the reader.

The overall effectiveness of library operations is based on the threefold approach: (a) on empirical methods in determining the objectivity of the services, (b) on conceptual evaluation of the social norms, and (c) on pragmatic assessment of the value of the services to the individual library patron.

Variations in the criteria used in book selection illustrate differences among the above dimensions:

(a) Book selection for information purposes focuses primarily on certain concrete characteristics of a book determined by the purpose for which they are acquired (e.g., statistical survey or subject bibliography). The judgment 'this book is good' means here that it possesses certain definable, empirically observable properties.

(b) In selecting a book for its circulating value (e.g., from the best reading lists) the criterion is not a specific empirically tested or conceptual property of the book but the attitude toward it. 'This book is good' implies that it is good for somebody; it circulates.

(c) In focusing on the diffusion of certain social values, the selection is based on a rational comparison between available books in terms of the norms expressed by them. We select the book which is 'better than' the other because of the similarity between the content of the book and the values it expresses.

Consequently the alpha-beta-gamma relationship is here defined by (1) singling out measurable characteristics in the empirical method; (2) listing its characteristics in the conceptual method, and (3) determining the meaning of the relationship in terms of responses to it in the contextual approach.

11.3.3.1 The procedural approach originated in the pre-Socratic Greek notion of the existence of objects independently of our knowledge about them. It views the universe as a machine with individual parts operating according to predetermined patterns, and it focuses on ways of measuring these patterns.

In metalibrarianship the procedural approach concentrates on a study of relations between the natural, physical properties of the alpha-beta-gamma relations, which can be quantitatively measured. It provides a scientific description in library operations by utilizing statistical tools. Its model is a machine: the subject matter of librarianship is a sum total of its various parts. It constitutes the theoretical background in organizing various library activities by determining needs for them and the most efficient ways of satisfying these needs.

Physical service to the patron is the main objective of the procedural approach. The better the mechanical arrangement, the more efficient is the service; the more empirical the study, the more verifiable are its results.

The significance of this approach is in abstracting the natural properties of the alpha-beta-gamma relations by studying the relationships' aftereffects. It assumes causality of relations, i.e., each interaction between alpha, beta, and gamma becomes a cause for a change in the reader's behavior. By studying past effects one can estimate their causes and anticipate similar effects in the future. For example, a study of library use by different classes of readers can establish numerical relationships between the age groups of patrons and their circulation pattern.

The precision of the procedural method is proportional to its scope. The smaller the sample tested, the more approximate are the results.

The procedural approach differs from the conceptual approach in its interpretation of the similarities within the relationships. Whereas the conceptualist classifies the meaning of the relationships studied, the proceduralist merely describes them. Both proceduralism and conceptualism focus on relationships, while the contextual approach stresses their environment.

Proceduralism as a philosophical viewpoint was finalized in the 17th c. Newtonian mechanistic philosophy based on three basic axioms or laws. (1) 'inertia' states that the natural position of everything in nature is a status quo unless affected by the force impressed on it. (2) 'Mass multiplied by velocity' creates motion which changes in proportion to motive force. (3) Every action is accompanied by reaction. Hence all physical systems are masses in motion, defined by the formula of force (cause of acceleration) plus matter (its quantity).

Newtonian principles were incorporated in 18th c. concept of physical chemistry and in 19th c. mechanistic biology and psychology. This led to the belief that living organisms are like machines, based on causal relations (change in A affects change in B).

Early 20th-century social sciences followed Newtonian philosophy by applying it to the interpretation of social phenomena. Proceduralism is still considered a major philosophical viewpoint in the applied theory of librarianship.

### 11.3.3.2 Contextual Approach

The contextual approach is akin to British empiricism and American pragmatism. It is based on the assumption that no concept has meaning unless it is derived from, or applied to, some sensory impressions. For example, two words are different not only in relation to the thing they describe, but also in communicating different experiences.

This approach differs radically from the other two by shifting the emphasis from the study of properties in the alpha-beta-gamma relations to the evaluation of the effects of particular relations.

This approach completely reversed the direction of analysis by focusing on individual, specific relationships. Instead of starting the analysis at the cause for the relation, the contextualist begins with the study of the effects of these relations, the actual reader's reactions to the material read.

The change is evaluated not in terms of procedural measurable expressions or conceptual similarity of meaning, but in terms of its effectiveness in satisfying particular needs. It is a problem-solving approach, in which each problem is unique, calling for a different solution. The stress on immediacy of experience results in a subjective approach, which can adjust to the constantly changing situation. It is a synthetic method aiming at a mediation between the procedural, particular attributes of the alpha-beta-gamma relations and their conceptual, qualitative similarities.

Essential to the contextual approach is the time: now. It is a most practical approach, best reflecting day-to-day library operations. It is however here discussed not as an aspect of practical librarianship, but as one of the three approaches stressing the environment of the relationships.

It provides a balance between the two contradictory forces in any scientific theory: between the expansion of the field's scope and the improvement of its precision. Consequently, if viewed as a library practice, void of scientific precision and logical consistency, contextualism would turn the library operations back to its pre-scientific stage of craftsmanship, preoccupied with the immediate effects of library service only.

On the other hand, if considered as an inseparable part of the three-dimensional metalibrarianship, contextualism becomes an essential blueprint for the theory of library management. It serves as a mediating concept between the two ideals of science: (a) the achievement of a total and purposeful knowledge, and (b) for a definite purpose: maximum adaptability. It is illustrated in library classification and cataloging that aims at a coverage of the total knowledge, organized in an easy-to-use system.

Although not explicitly stated, the dimensional relationships between the primary terms discussed here are present in a number of other library-related theories. For example, Dervin's model of neutral questioning is based on the three basic elements of 'sense-making' theory: the situation, the gap, and the use. "The situation refers to those events in a person's life that create the context for a lack of sense, or a gap, i.e., an occurrence that raises questions." (The contextual environment.). "The gap, seen only in the mind's eye, is translated into question form during the reference interview, and the answer to the question may be seen as a bridge across the gap." (The conceptual focus.) "The third element . . . is the use that is made of the answer--what the seeker/user hopes to do after crossing the bridge." (The procedural application of information received.)[22]

### 11.3.3.3 Conceptual Approach

In metalibrarianship the conceptual approach studies the relationships between the intangible attributes of librarianship's subject matter. It is a qualitative approach, evaluating particular relationships among alpha, beta, and gamma, in terms of the degree of similarity between the corresponding properties of each.

Its overall model is an ideal, hypothetical relationships between these properties (e.g., the perfect book is one which completely expresses intended ideas, exactly fulfilling the needs of the reader).

This approach provides bases for planning the best possible library organization, defining its goals (i.e., the most desirable objectives aimed at). Its main tool is a logical consistency in formulating a theory about alpha-beta-gamma relationships. The better developed the conceptual approach, the larger the scope of the discipline will be.

This is probably the oldest philosophical concept, dating from Pythagorean belief in the expression of a world-intelligence by the intelligible order of numbers, through Plato's definition of reality, up to the Hegelian notion of reality in terms of the categories of mind. In all of them, knowledge is conceived as the intuition of the necessary connections between sense-experiences and abstract ideas about them.

### 11.3.3.4 Limitations

Each of the above approaches is sufficient in interpreting the alpha-beta-gamma relationships from its own vantage point: library procedures are best accounted for by procedural, empirical method, its goals and objectives by conceptual formulation, and actual library practice in terms of a given library context.

But none in isolation can satisfactorily address the whole range of alpha-beta-gamma relationships, since these relations are all equally determined by technical processes, standards, and services.

### a. Procedural Limitations

Procedural limitations relate directly to their virtues: quantitative precision is void of the qualitative, conceptual, and subjective scope of contextuality. Essentially descriptive, empirical findings refer to alpha-beta-gamma properties in relation to some other previously determined standards of significance.

Consequently, empirical evaluation of the significance of alpha-beta-gamma relationships is subject to the fallacy of shifting terms, since the same statistical data cannot simultaneously both describe and explain the same phenomenon. For example, the question 'What is read in the library?' answered statistically cannot also answer the question 'Why is it read?.' Furthermore, a mere addition of various empirical findings does not define the totality of the alpha-beta-gamma relationship, since the arithmetical sum is quantitative, excluding conceptual and contextual values.

### b. Conceptual Limitations

The basic limitation of this approach is its 'totality' of the relationship under consideration. Totality is a dynamic state which changes constantly, with each experience, hence the conceptual relation is 'grasping' the totality of relations but only at any one particular time. This limitation is partially corrected by upgrading or revising the library's goals to stay abreast of the changing situation.

### c. Contextual Limitations

Contextual limitations are created by the unpredictability of the behavior of an individual reader and consequently by the difficulty of predicting the demand for library resources and services.

As a free agent, an individual reader exhibits motivation which is difficult to anticipate; contextual studies therefore focus on past patrons' behavior. This subjectivity can be minimized by balancing the contextual interpretation with the procedural measurements and conceptual valuation.

### d. Overall Limitations

In summary the procedural approach gives us the method of operations, the conceptual the purpose, and the contextual the conduct of library operations.

We determine library purposes by establishing similarities between given characteristics in the readers' environment and books selected by them. We then pinpoint similarities by using the empirical method to locate related characteristics and adjust library operations by an appropriately designed method of service.

Library practice translates these theoretical formulations into actual library situations. Metalibrarianship focuses on the knowledge of relations between alpha-beta-gamma on three interdependent levels, as shown in Fig. 11-3, below.

Relationships between alpha-beta-gamma on:

| EMPIRICAL | RATIONAL | PRAGMATIC |
|---|---|---|
| levels with reference to the: | | |
| Actual experiences | Intellectual concepts | Actual consequences |
| of these relations, | | |
| Experienced a posteriori | Postulated a priori | Verified in use |
| and formulated in terms of: | | |
| Empirical Science | Rational Knowledge | Common Experience |
| of alpha-beta-gamma relationships, resulting in a three-fold approaches: | | |
| Scientific (Procedural) | Theoretical (Conceptual) | Practical (Contextual) |

FIG.11-3: A Threefold Approach to Metalibrarianship

### 11.4 The Conceptual Root-metaphor

In general, root-metaphors are the ultimate presuppositions of a frame of reference for a discourse; they serve as "linguistic orientations that provide a notational system in which certain kinds of data, and not others, appear as evidence."[23] While the implicit root-metaphors are below the level of consciousness, the comprehensive "root-metaphors describe worlds, whereas models describe the contents of those worlds."[24]

The root-metaphor explains the essential metaphysical nature of metalibrarianship as a never-ending process of examining knowledge by relating less-known to more familiar experiences. The primary root-metaphor is the relationship between alpha-beta-gamma interpretation of the content of the message and the communication channel used, analyzed within the framework of the three world hypotheses. Each hypothesis is formulated in terms of its own, secondary root-metaphor: machine-like, quantitative properties in proceduralism; pragmatic, contextual relations viewed in terms of a particular 'communication act in the context'; and qualitative, conceptual aspects of relations perceived in terms of the root metaphor of similarity.

### 11.4.1 Primary Root-metaphors [25]

The primary root-metaphors alpha, beta, and gamma represent the total, untapped, potentially available passive relationships. They can be transformed into interactive, specific relationships by coupling each element with another.

Elements alpha, beta, and gamma, related by the relation (R) are the primary elements of metalibrarianship; i.e., they are transplanted from other disciplines and are undefinable within the system. Each of these elements always has to be considered within the triadic relations; none is meaningful by itself.

The universe of discourse, the relation $R( \ , \beta, \ )$ is the subject matter of the metalibrarianship.

The postulates of the model consist of a threefold interpretation of the relation R:

$$(1)\ R = F(\alpha, \beta, \Gamma)$$

Relation R is a function of a particular set of quantitative characteristics, associated with $\alpha$, $\beta$, and $\Gamma$.

(2) R connects $\alpha$, $\beta$, $\Gamma$.

Relation R is a formulation of similarity between characteristics.

(3) R($\alpha$, $\beta$, $\Gamma$) reflects context.

Relation is interpreted in terms of effects in a given context.

So formulated, the statement of the relation determines the study of metalibrary subject matter on three independent levels: empirical, procedural (R1), contextual, pragmatic (R2), and conceptual, theoretical (R3) relationships between $\alpha$, $\beta$, and $\Gamma$. The above relationships are reciprocal, interrelating the scientific, philosophical, and practical levels.

### 11.4.2 Conceptual Root-metaphor Transfer [26]

The conceptual root-metaphor transfer is a process of converting d-i-k relationship into its perception by an individual participant in the $\alpha$-$\beta$-$\Gamma$ process:

$$(d \rightarrow i \rightarrow k) \rightleftharpoons (\Gamma -- \beta -- \alpha)$$

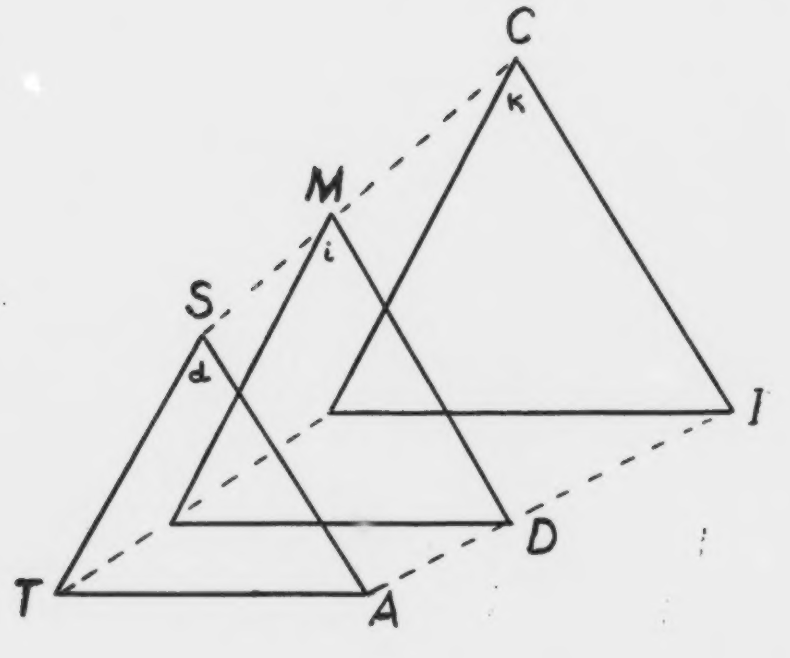
C
k
M
i
S
d
T
A
D
I

FIG. [illegible] PRIMARY CONCEPTUAL ROOT-METAPHOR TRANSFER
IN METALIBRARIANSHIP

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i.e., the d-i-k transfer is equivalent to α-ß-Γ root-metaphors in terms of metalibrary modules, which defines these relationships.

Fig. 11-4 illustrates various relationships in the process of the d-i-k transfer into the primary components of the root-metaphor model, α, ß, Γ.

In the diagram the following symbols stand for:

Γ (carrier of the message-signal)
ß (content of the message)
α (interpreter of the message)
S (signal)
M (message)
C (concept)
A (awareness of the stimulus)
D (description of the message)
I (interpretation of the message)

d (data) is defined by a triangle Γ-A-S i.e., as an awareness (A) of a signal (S) present in the carrier (Γ) (Signal is interpreted in terms of Shannon's theory.)

i (information cluster) is defined by a triangle ß-D-M), i.e., as a description (D) of the meaning (M) of the content of the message (ß) (Information cluster was defined in Chapter 10.)

k (knowledge) is defined by a triangle $\alpha$-I-C

i.e., as an interpretation (I) of the concept emerging from the content of the message (C) by the interpreter of the transfer ($\alpha$) (Knowledge is defined as relations known.)

The process involves three levels of interpretation:

(1) Extrinsic description of d-i-k transfer:

(carrier)-->A (awareness of)-->S (signal)

(2) Intrinsic description of d-i-k transfer:

$\beta$ (content)-->D (description of)-->M(message)

(3) Insight into the meaning of the message:

$\alpha$(interpreter)-->I (interpretation)-->C (concept)

The relationships manifest a structural unity, which resembles Aristotelian aesthetic principles of dramatic structure:

(1) unity of time (or a moment): $\alpha + \beta + \Gamma$ relates to specific instant relationship

(2) unity of location (or space): A + D + I relates to specific environment of relationship

(3) unity of action (or a process): S + M + C relates to specific information transfer

The d-i-k transfer consists of three phases: (1) an initial, static, relationships: $\Gamma - \beta - \alpha$ ; (2) converted through an awareness of the signal in the carrier, described by its content, and interpreted by the receiver of the message, A-D-I; (3) completing the d-i-k transfer into stimulus-its meaning and new concept (S-M-C).

The starting point in the d-i-k transfer is the perception (awareness, A) of data in a form of a symbol (printed characters, painted form, sounds, etc.) encoded in the carrier ($\Gamma$). It follows by the description (D) of the content ($\beta$) of the message (M). The process is completed by the receiver of the signal ($\alpha$) interpreting (I) the message into an understood concept (C).

Thus, an initially passive alpha-beta-gamma relationship is transformed metaphorically into an active relationship between the concept-message-and its receiver, initiated by the d-i-k process.

A concept is initially formulated in the mind of its creator. It is an idea expressing some aspects of the physical as well as the nonmaterial reality, and it may be considered in the context of the discipline to which it refers, such as specialized concepts in sciences, art, music, literature, or library science.

Each interpretation of concepts is also subject to the internal idiosyncrasies of its own discipline. The meaning of the concept (M) is expressed as a message recorded in one of many communication media, such as a book, a painting, a film, or a compact disk. Its meaning, however, is metaphorical, since it bridges the intent of the originator's ideas, with the interpretation of the message in the medium (M) by its receiver.

The response to the original concept may be in the form of a behavioral reaction of an individual (e.g., a reader of the book, or a listener to the symphony), of a group of individuals (expressed, for example, by passing a resolution by a community of individuals as a whole), or of the whole society, illustrated by the mores of that society. The response may at the same time initiate new concepts, as a part of a chain of conceptual sequences in the development of knowledge.

The triangular relationships point to their basic interdependence. Thus the artist's concept, for example, is influenced by the medium in which the concept will be expressed, and its meaning will vary with the interpretation made by the viewer of the work.

The meaning of the relationship is also directly affected by the level of communication discourse (ADI): starting with an intuitive awareness of the relationship at the level of acquaintance (A), further elaborated by the metaphoric and subjective interpretation of the meaning at the descriptive level (D), and cumulating in the form of a symbolic representation of the relationship at the informative level of discourse (I).

### 11.4.3 The End-results

The model suggests its own metaphysical answers to the basic philosophical questions:

(a) It defines metalibrarianship as a metaphysical inquiry into the meaning of the discipline. In this sense, metalibrarianship is a study of a unique relationship as it is expressed in the model by interdependence within a communicative discourse;

(b) It provides a philosophical explanation of metalibrarianship as a domain of epistemological study of differences between various relationships within the model, as they are revealed in a metaphoric approach. This explanation is formulated in the language of specific disciplines. The scientific inquiry may ask why some of the relationships suggested by the model do exist. In the sociological approach one may ask what is the meaning of the relationship in a societal context. A psychological investigation may concentrate on the same question, but analyze it within an individual's own human context.

(c) It suggests a justification of metalibrarianship as a discipline in terms of an axiological, value-oriented equity. Together with other disciplines, metalibrarianship is evaluated in terms of its service to the society. Its overall aim is to maximize the availability of knowledge to individuals and, through them, to social groups, thus implying an ideal interdisciplinary and cross-cultural language of communication which will offer an insight into the meaning of the communication message, free of restraints of any kind.

The relations in metalibrarianship reflect a psychological, introceptive process of fusing the external perception of reality with its subjective image. In this process, mind is associated with the object of its cognition. The focus of all these processes is on (a) a cognoscendum, the object of the cognition of the content of recorded message, (b) on an intervening agent, and (c) on a physical format of the information carrier as it is perceived by an individual interpreting the relations.

A cognoscendum can be real and existent, abstract and ideological, or fictitious and imaginative. It is expressed in this book in a form of d-i-k transfer, its meaning, and the level of introceptive cognition.

D-i-k transfer describes the procedural process of communicating messages to their recipients. It is a process of introception. Conceptual root-metaphor defines basic conceptual relations in the introceptive processes.

Psychologically, introception refers to the processes of adapting social values to one's own motivation. Sociologically, it relates to an individual's degree of conformity of behavior with that of an individual's peer group.

Metalibrarianship can be justified if it can communicate universally, at different levels, on different issues, seen from different viewpoints. The metaphorical method offers that flexibility; it also offers an unrestricted insight to the meaning of words that are communicated, reflecting variations in cultural and personal needs of individual library users.

## 11.5 Metalibrary System [27]

### 1.5.1 Introduction

Kenneth Boulding (1956) identifies two methods of organizing theoretical systems. One is based on selected phenomena common to many disciplines. The other arranges various theories by the degree of complexity in organizing their basic concepts. In each case a hierarchical structure would reveal gaps in the theoretical structuring of such disciplines. "Even at the simplest level, . . . the problem of the adequate description of complex structures is still far from solved. The theory of indexing and cataloging, for instance, is only in its infancy. Librarians are fairly good at cataloging books . . . [However,] the cataloging of events, ideas, [and] theories . . . has hardly begun."[28]

In this section the meanings of library concepts are defined by delineating some essential characteristics of the metalibrary system. The conceptual relationship is here defined in terms of the internal similarities between alpha, beta, and gamma and their external descriptions.

### 11.5.2 The Subject Matter of Metalibrarianship [29]

The subject matter of metalibrarianship (d-i-k) is restricted exclusively to the characteristics shared in common by a medium of communication (a generic book), the subject it refers to, and the particular reader.

Metalibrarianship is an eclectic discipline. Each of the above primitive terms is initially a subject matter of different disciplines: The reader (alpha) is a focus of studies by behavioral disciplines such as psychology and education. The carrier's content (beta) is of interest to a variety of disciplines from abnormal psychology to zymurgy. Physical aspects of the knowledge carriers (gamma) are studied by empirical or applied sciences such as typography.[30]

### 11.5.3 Internal Relationships

#### 11.5.3.1 Constituents

The conceptual relationship between alpha, beta, and gamma is discussed in terms of its four constituents: (1) need (N), an awareness of a necessity to attain certain goals; (2) a goal (G), a specific end or objective sought; (3) means (M), an act, instrument, or method used in attaining the goal; and (4) fulfillment (F), the state of actual completion of a task at any given moment.

The constituents can be considered as universal components in the alpha-beta-gamma relationship, since each is present in every library situation. For example, a library patron is motivated by a need to use the facilities of the library in terms of specific goals, the fulfillment of which is related to the use of the means (facilities) offered by the library. Similarly, each library procedure is originated by a need to achieve certain objectives that designate the means for fulfilling them.

### 11.5.3.2 Attributes

The degree of interrelationship among the four constituents can be expressed in terms of the three universal elementary attributes of (1) efficiency (e) of a particular means in reaching the goals or its complement, waste (w); (2) satisfaction (s) expressing the degree of fulfilment of a need or its complement, dissatisfaction (d); and (3) lacuna (l) indicating the disparity between goals aimed at (g), and the degree of their fulfillment or its complement, achievement (a).

### 11.5.3.3 Definition of a Metalibrary System

A conceptual library system, defined in the above terms, is illustrated below. [Fig. 11-5]

In this illustration, the system itself is enclosed within a triangular pyramid (FGMN) that represents the total relationship between the subsystems alpha (FGN), beta (FNM), and gamma (FGM) in terms of elements F, G, M, and N and their attributes, e, a, and s.

Thus, a carrier of information gamma (e.g., a book) can be defined in this system as a means M employed for the achievement of goal G. Its efficiency e is related to the gap l between goal G and its fulfillment F.

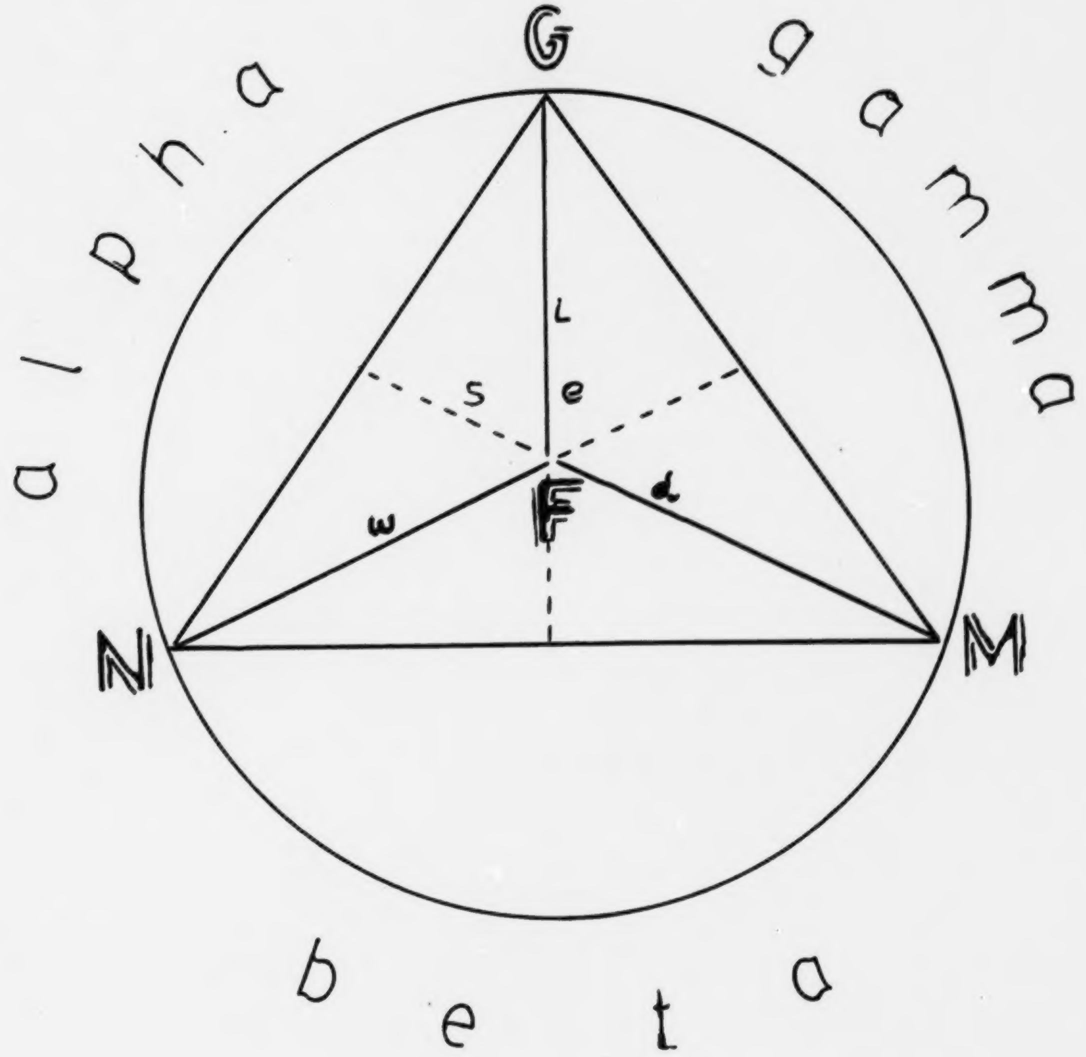
G
N
M
F
L
s
e
w
d
alpha
gamma
beta

FIG. 11-5: CONCEPTUAL RELATIONSHIPS BETWEEN ELEMENTS IN METALIBRARIANSHIP 31

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The library user alpha is conceived as an agent fulfilling his needs N to obtain the goal G. The agent's satisfaction s represents the degree of fulfilling the goals (g) and its achievement (1).

The content of the carrier, beta, transacted in the library is interpreted as the information contained in the carrier of information, gamma, fulfilling the need of the user, alpha. The transaction is evaluated in terms of its efficiency e and the satisfaction s resulting from that fulfillment.

Central in this model is the study of the notion of a system, not its component parts. The objective is to isolate and analyze conceptual forces shaping a given pattern of behavior within the system. It is analogous to the study of the behavior of a magnetic field considered independently from the metallic substances or electric sources which generate the magnetic force. Thus, here the attention is focused not on the properties of elements making up the library system, but on the internal forces within the library system that are responsible for certain static or dynamic relations.

### 11.5.3.4 Conceptual Classification

The primitive terms are here considered as the primary elements of library science, each meaningful only in terms of triadic relations. [Fig. 11-6] We are not concerned with the carriers of information gamma, the user of library material beta, or the knowledge sought beta as such, but in the relations between them. Similarly, the efficiency e, satisfaction s, and the achievement a, can each be defined only in terms of the other two attributes.

| Approach | Primitive Terms | Relations Between | Formators (Constituents) |
|---|---|---|---|
| Quantitative (Primary) | alpha<br>beta<br>gamma | GMN | N<br>M<br>G |
| Qualitative (Secondary) | e; w<br>s; d<br>a; l | FGM<br>FGN<br>FMN | F |

Fig. 11-6: Conceptual Classification

Each complex relationship becomes an autonomous subsystem of the library system. Each subsystem can be analyzed in terms of its constituent relationship.

The formators are the specific constituents of the primitive terms. They are indispensable in the definitions, or in the formulation, of the primitive terms. Thus, need, means, goals, and fulfillment are the components of the relationship between primitive terms alpha, beta, and gamma within the secondary terms e, s, and a.

The distinction between the quantitative approaches points out to two kinds of variations in the primitive terms: (1) variations in the degree of extensive 'quantity' expressible numerically (primary terms) and (2) variation in the kind of intensive 'quality.', a nonnumerical expression of accomplishment and its significance (secondary terms).

The use of the notion 'quality' and 'quantity' is relative. Calling the primary terms quantitative is not meant to endow them with a physical or measurable existence, but rather to point out that they exist on a somewhat lower level of abstraction than the secondary terms. For example, gamma could be interpreted as some sort of statistical representative of books in general, or alpha as an average user, while e can only be interpreted after gamma has been defined.

Both the quantitative and the qualitative approaches deal with the formators (F, G, M, N) that are inherent in, and inseparable from, any relationship. Thus, no conceptual relationship between alpha, beta, and gamma can be perceived in Library Information Science without considering F, M, N, and G. Furthermore, any specific relationship between alpha, beta, and gamma can be discussed only in terms of the corresponding M, N, and G.

Library Information Science is a service-oriented discipline, and any evaluative approach involves an estimation of success in performing certain tasks. Thus, the qualitative approach is always related to fulfilment F, which influences highly variable qualities of e, s, and a and is dependent on a specific configuration within the relationship itself.

The quantitative approach is basically a procedural study of physical properties, while the qualitative approach is essentially a contextual study of the effect of given properties on the overall relationship.

These two approaches are familiar to librarians in areas of the theory of applied librarianship and in sociological evaluation of Library Information Science. Although they are not the subject of direct concern in this chapter, their conceptual interpretation is at the core of the model.

### 11.5.4 Laws Governing Basic Relations

Fundamental relationships between the constituents and their attributes can be analyzed at three different levels: structural, operational, and evaluational.

Basic Law of Structure. The conceptual interrelationship between the basic constituents (F,G,M,N) defines a library system at any given point and can be expressed symbolically as:

$$(\text{alpha} + \text{beta} + \text{gamma}) = \Delta\ (\text{delta})$$

where delta = 'degree of competence'

If delta is constant, any change in the total configuration of primary terms (alpha-beta-gamma) results in a change in the total configuration of secondary terms (s+e+a), and conversely, any change in the secondary terms affects the total configuration of primary terms. In interpreting the terms as components of the diagram, we see that any change in the formators affects the configuration.

*Operational Law*. The operational interrelationship between the primitive terms alpha, beta, and gamma define a given library system in terms of the quantitative characteristics of each term. These quantitative characteristics are expressed in terms of their impact on the total alpha-beta-gamma relationship.

*Proposition 1* (Operational law)):

$$\text{alpha}+\text{beta}+\text{gamma} = \text{omega}; \quad \text{where omega} = \frac{\text{delta}}{s+e+a}$$

*Valuational law*. The valuational interrelationship between the attributes e, s, and a in any given library system defines the qualitative characteristics of each primitive term. Since e, s, and a converge at the point F, the fulfillment of the goal becomes a common denominator for each attribute.

*Proposition 2* (Valuational law):

$$s + e + a = \$; \quad \text{where } \$ = \frac{\text{delta}}{\text{alpha}+\text{beta}+\text{gamma}}$$

The Basic Law of Structure and its two derivatives may help clarify some of the commonly held misconceptions about library competence, such as a notion that the competence of a particular library can be improved by manipulating its basic components. Yet, means M, needs N, goals G, and their fulfillment F, are the formators of library operation in the same way that the horsepower of an engine determines the optimum power of a car. Library performance is manifested by its operations within prescribed limits of M, N, G, and F. To claim the ability to change these limits is to consider oneself external to the library system.

Another mistaken notion is the view that one may have an excellent library in a mediocre university. The degree of competence is defined in the Basic Law of Structure in terms of the totality of alpha-beta-gamma and s-e-a characteristics. Each of these two groups of factors can be visualized as proverbial black boxes. The conceptual excellence is measured in terms of relationships between the contents of these two boxes. In each of them, the library user, his interest in the services offered by the library, and the library's success in meeting these needs are important factors of excellence. A well-selected collection with a high-level service organization above and beyond the needs of its users is no more useful to a service institution than a cannon is useful in hunting pigeons. Both are conceptually wasteful.

Any attempt to develop formulas for measuring the competence of a library in terms of physical volumes in its collection overlooks essential characteristics of competence: the fact that the size of the collection gamma, is related not only to the number of potential users alpha, and the fields of curricula concentration beta, but it also reflects the efficiency of a particular collection, e, in contributing to the user's satisfaction s, in achieving the goal a. These are subjective but yet essential attributes of library service. An increase in the number of physical volumes may increase the degree of competence, if s, e, and a remain constant (i.e., additions of well-selected volumes in terms of s, e, a).

An increase in the competence may also be achieved by improvement in s, e, a with alpha-beta-gamma constant (e.g., through improved accessibility to the collection). But the measurement of the competence itself (the consideration of the value of delta) can be expressed satisfactorily only in terms of all the elements of competence. Hence, each competence is defined in terms of certain qualifications in addition to minimal specific requirements; competent art collection is distinguished not only by the number of paintings it contains, but also by the number of outstanding esthetic characteristics of each painting.

Any formula for minimum adequacy is, at best, an educated guess about what size library collection provides enough variety to satisfy the needs of the average user. In effect such formulas suggest the optimum size for minimal needs.

### 11.5.5 A Pattern of Changing Concepts

#### 11.5.5.1 General Systems

The conceptual development of a metalibrary model is governed by principles that are equally valid for any other theoretical system. The generalizations concerning patterns of change are formulated by general systems theory and are supported by historical observations of the development of scientific thought. Many similar general conceptions have developed in different disciplines independently of each other (Bertalanffy, 1950).

The objective of this model is to attempt to trace some of the principles governing the dynamics of library change as here interpreted. They can be formulated by analogy with general systems theory. The analogy rests on three assumptions that: (1) a correspondence exists between quantitative aspects of physical structure and abstract concepts in a metalibrary model; (2) a similarity exists between the qualitative behavior of physical systems and the conceptual behavior of abstract systems; and (3) concepts in Library Information Science are constructed in terms of 'facts' which exist independently of our theories about them.

One major difference between the two approaches, however, is in the interpretation of reality. In metalibrarianship, physical models are related to conceptual reality, but some general system models adapt conceptual models to physical reality while our conceptual models relate physical models to conceptual reality.

### 11.4.5.2.Meaning of concepts.

The degree of meaningfulness of a concept is always measured in terms of the elements of which it is constituted. If a concept contains no elements, it is meaningless; if it has one element, its meaning is arbitrary; if concepts have two elements, there is only a tentative definition of their meaning. Thus, the meaningfulness of a concept is related to its complexity.

The significance of meaning is perhaps best emphasized by realizing that it indicates a relationship. Thus, a gamma with reference to itself is an arbitrary statement (e.g., 'a book is a book'); while a gamma referred to an alpha (e.g., a book for its user) communicates a synonymy that relates a book to a user in a very loose sense. It is for this reason that the present theory is based on the relationships between at least three elements, alpha-beta-gamma (e.g., the book's content for its user). This is the smallest and least complex primitive relation that is meaningful.

### 11.5.5.3 Subsystems of the Model

Each of the primitive terms (alpha, beta, gamma) could be analyzed in terms of its own component parts (e.g., size, quality, and weight of the paper, type of the printing in gamma), which in turn, could be expanded to other fields (e.g., theory in book making). In this essay, the internal characteristics of alpha, beta, and gamma are significant only in terms of their interrelations (i.e., the size of the book or the quality of the print are important only in a sense of affecting the extent of content of the message transmission, beta, to the user, alpha). Hence, no further analyses, beyond alpha-beta-gamma and its subdivisions, are carried out in this essay. In s, e and a, each element can refer to at least one alpha-beta-gamma relation (e.g., satisfaction of the user, alpha in his selection of a given carrier of information, gamma is determined by the quality and amount of content of the message provided by beta).

For this reason, s, e, and a, can be studied separately each as a subsystem of the total library system. Changes affected by s, e, and a of the library system do not alter the basic library structure, since they are confined to these three basic subsystems. Thus a study of library change involves the study of internal changes in the three subsystems s, e and a.

### 11.5.5.4 Degrees of Dependence and Structure

Any two concepts are independent of each other if they have no common components. The subsystems s, e, and a, are not independent of each other since all three share the component F. Also, as stated in Proposition 2, the behavior of any of the three subsystems affects the other two. The degree of structuring in the primary terms alpha, beta, and gamma determines to some extent the degree of complexity of the subsystems s, e and a and their interdependence on each other. That is, the more structure there is inherent to alpha-beta-gamma, the greater is the capacity of s-e-a for more constituent relations and hence greater complexity.

In the library systems of primary terms (GMN), the unstructured concept of the user stands for the sum of mutually exclusive elements such as young readers, female patrons, professional library users, etc. This concept of user is expressed statistically as the total number of people requesting a service. The structured concept of the faculty user in the university library, on the other hand, is defined by the interrelationship of various demands imposed on the library by its faculty. For example, a faculty member as a teacher may seek instructional material (e.g., asking for secondary sources such as textbooks), while the same faculty member, as a researcher, may also seek original material (i.e., primary sources, such as dissertation or experimental reports).

The interplay between those roles can be illustrated by the demands of a teacher-researchers in a graduate program. The relationship of their pedagogical interests and their research involvement affects their interest in doctoral students. This, in turn, sparks a demand for library material which is too advanced for the courses they teach, yet too elementary for their own research. Thus, the structured concept of the faculty user reflects, in an essential way, various interrelated roles of a faculty member, and cannot be treated merely as a statistical sum of specific elements.

### 11.5.5.5 Change in Systems

A significant change in a subsystem can be defined as a change in its complexity, where a positive change increases, and negative change decreases, the number of relevant relations that make up a subsystem. A steady state exists when the complexity of the system remains constant. For example, a positive development in satisfaction s can be affected by intensifying the involvement of gamma with F by finding a more readable or informative book or by displaying a book to make it more accessible. In either case, new ways of involving the 'book' in the process of 'fulfillment' are brought into play, thus increasing the number of relevant relations encompassed by the s of the $\tilde{s}$ystem. In this sense, for example, the microform may replace the book-form as a more convenient method of storing information or as a more useful tool for the reader. Only if both the storage and use of the microform become more satisfactory than those of the book-form can it replace the book-form as an accepted carrier of information. This is the principle that explains the evolution of the concept of the book-form from papyrus, clay tablets, and parchment to the paper format and computer data.

### 11.5.5.6 Equilibrium.

The library system aims at the increase of the totality of s, e, and a. It acts to counter d, w, and l. Although dissatisfaction, waste, and lacuna can never be eliminated completely from a given library system, there may be certain configurations for which any small change will produce an increase in the totality of d, w, and l. Such configurations are called positions of relative equilibrium: a library system will not move from a state of equilibrium of its own accord.

However, it is important to realize that while configurations near equilibrium may have larger total d, w, and l, there may be other configurations not so near to the equilibrium that actually have a smaller total d, w, and l.

A configuration with the lowest possible d, w, and l is called a point of absolute equilibrium and can be regarded in some sense as the best possible state of a given system.

The concept of equilibrium may be illustrated by analogy with the differences between traditional and progressive library organizations. A conceptually traditional library operates within rules established long ago. A user is viewed as a stereotype with predictable needs, and the types of services offered are well fossilized. The expansion of services is not anticipated; curtailment would meet user resistance, forcing the library to return to the old ways of service.

A progressive library challenges the static concept by searching for new equilibrium between alpha-beta-gamma and s-e-a. However, the dynamism of this approach is not a mere expansion of external factors such as enlarged library budget, or changing profile of the undergraduate student, since one can expand the pyramid NMGF by stretching its points proportionally, without altering the internal equilibrium. The dynamism of such a change is in the rearrangement (not the addition) of factors already in the system.

### 11.5.6 External Change

The concept of equilibrium controls the internal change of a given system, for within the context of a given M, N, and G, changes take place in the subsystems until the total complexity of the subsystems s, e, and a is maximized.

However, it is also possible that the external conditions of the library may change in some sense so that what was formally an equilibrium state becomes disequilibrium. For example, a change in the quality of a university may result in a revision of its library goals, affecting the G-F disparity and the total s-e-a configuration. Soon the system will undergo internal change seeking new equilibrium.

#### 11.5.6.1 Leading Elements

Within each subsystem, different constituent relations are endowed with differing relative weights, contributing more to its complexity than others. For example, in the illustration of the development of microforms vs. book-forms, the physical space occupied by a carrier of information, up to a certain critical size (of the collection), contributes less to its effectiveness, than, e.g., its physical durability or the ease of reading.

However, at some point in the growth of a collection (and in the technological development of microforms), the consideration of space may take on new importance. Thus, the effectiveness of a particular form (book-form) of gamma may change drastically relative to other forms of gamma.

11.5.6.2 Principles of change:

(a) Principle of internal change: A given library system (N,M, and G fixed) will change so as to increase the total complexity of its subsystems a, e, and a (a positive change);

(b) Corollary: A library system will not normally move from a state of equilibrium;

(c) Principle of external change: a change in the formators (N-M-G) changes the basic library system and induces change by altering placement of equilibrium.

The more traditional the library system, the more stationary are its component parts. One can change the status quo only by addressing oneself to the aspects of s, e, and a that were neglected previously. For example, a search for the greater efficiency of technical services results in a more complex e, which in turn affects the s and a.' In the traditional concept of cataloging, for example, the quality of the information on a cataloging card was more important than the number of cards processed. Hence, a simplification of descriptive rule was more significant than the issue of speed of cataloging. In a more recent computer approach, the use of Library of Congress entries resolved the problem of quality cataloging at the local library level. This allowed the individual library to concentrate on the problems of quality of original cataloging, and improvements in the network technology affected technical services more than ever before.

With the use of on-line cataloging, verification of an entry with a book at hand becomes the main quality factor. In the case of a traditional library, a small change in rules of corporate entry would be far more significant than the introduction of new computer technology. In a progressive library, a major change from ALA to AA rules of descriptive cataloging was more or less taken for granted, since it was incorporated in the L.C. entry and accepted by the individual library 'as is'. Instead, the attention is now focused on technology (e.g., the application of new computer strategy or network system), since the modification in this area may have a greater impact on the total services of a given library.

All three principles are illustrated indirectly in the major shift of interest in the debate on computer applications to library operations. A whole range of issues, from the concept of main entry through filing rules to details affecting the aesthetic appearance of a catalog card are being revised in terms of their adaptability to the computer system. Modern concepts, such as central processing, may alter considerably the relative significance of a number of elements in the library system through an external change within the subsystems (s, e, a).

It may be noted that the retention of the alpha-beta-gamma concept of the library system is critical in these changes. If, for example, the factor of cost is dominant in the centralized approach, it may overshadow the consideration of service to the library user. The profit motive of a commercial approach is not necessarily synonymous with the real needs of the library patron. Thus, for example, subsidized by the library, commercial services that provide electronic retrieval of information directly to the user are utilized by the patrons more than if they were offered manually for a fee. Furthermore, if such technology is developed as a means for fulfilling the goals for which the information is sought, it would supplement the role prescribed by the present library system. However, if the technology became a goal in itself, persuading or forcing the user to change his goals to satisfy those of the 'new approach,' (as in cases of not-so-friendly computer systems), it would replace the concept of the library system with a concept foreign to the philosophy of contemporary librarianship, and would not be easily adapted by the patrons.

## 11.6 Modality of Discourse in Metalibrarianship.[32]

### 11.6.1 A Framework

Communication in metalibrarianship is here defined as a link between the idea expressed in a recorded message and its recipient. The discourse itself is characterized by at least four unique futures.

(1) It is always initiated by a recipient of a message, and its duration is determined by the recipient's degree of receptiveness to the carriers of information. A book is a passive participant in a metalibrary dialogue; it cannot start or terminate the dialogue, nor can it regulate the amount of information that can be communicated to its readers. The book can, however, be more or less attractive by means of its format, style, and the subject of its content. It is the recipient of a message who determines his relations to that message and not vice versa.

(2) The library communication is an act, influenced not only by the content of the carriers of messages and their recipients' degree of receptiveness, but also by the contemporaneousness of the dialogue, its existence now, and not when the message was originally formulated or printed. The metalibrary discourse involves a number of specific conditions, such as the degree of intellectual curiosity and psychological mood of the reader, the conduciveness of the reading environment to meaningful communication, or the impact of events preceding the act of reading.

The dialogue depends on a degree of synchronization between the reader of the book and the message formulated by the author at any given instance of communication.

(3) The meaning of the message emerging from a metalibrary dialogue is metaphorical. It is a product of both the original concepts, expressed in a recorded message, and the recipient's own interpretation of that message. The book can be read many times by the same reader, each time revealing different meaning. Similarly, the same book read by two different people will most probably be interpreted differently by each person. Communicated meaning cannot ever be repeated exactly.

(4) The dialogue is one-directional, from the concept (C), as formulated by its creator, and communicated through the message (ME), to its recipient (R).[33]

C ----> M ----> R

So, although started by the library patron at the time of noticing the book, the discourse begins with the message and is sustained by the reader. The reverse direction, the reading into the message, is not a dialogue, but a form of a soliloquy. An individual book in a library collection, like any object of art, must first be identified by the library user for its potential value to him. It is the user of a collection who not only selects a particular book in a collection but is also willing to receive its message.

The dialogue between the book and its reader, in the objective, sense, requires the reader to 'tune' his thinking to that of the author of the message. Yet, in part it is also a subjective communication, imposing the reader's own perception on the meaning embodied in the message; the result is a communication of some meaning new to the reader, a kind of a metaphorical discovery.

This is a unique situation, one in which a library user not only must be motivated by some subjective, intellectual need to satisfy his own desires, but also must have enough objectivity to be able to modify his perceptions by newly learned facts or ideas.

### 11.6.2 Objectives

The ultimate objective of any theory in library science is to provide a framework for a mediation between the concept (C), its meaning, the message (M), and the reader's response to the message (R). Thus, the subject matter of any philosophy of librarianship must include a study of relations between two kinds of reality: (a) a physical reality of a given, empirically determined state of knowledge which constitutes the actual content of a library collection; and (b) a conceptual reality of the mental state of the library user, which is psychologically related to that individual's responses to information.

The physical reality is defined in terms of a type of C-M-R relationship, and it depends on such factors as the scope and depth of the library collection.

The conceptual reality is a mental creation of a library user, who assembles the perceived messages into an organized, synthetic totality of his own knowledge.

Thus the usefulness of any library collection is determined by the level of apprehension of the meaning contained in the collection by its users. These two realities are interrelated by isomorphisms, a law of organization which describes a structural correspondence between any given empirical, physical collection of data (or messages) and their conceptual, mental perception.

Isomorphism determines the relationship between the corresponding elements of each reality; it is based on the assumption that each reality is intelligible, so that it can be comprehended by rational interpretation of similarities or differences between itself and the other reality. The intelligibility, in turn, implies organization of parts into a whole.

Gestalt theory is thus relevant to this approach in its two basic concepts: (a) what happens to a part of the whole is determined by intrinsic laws inherent in the whole; and (b) the intrinsic laws are formulated in terms of the proximity among the elements perceived as a whole.

The Gestalt formulation reinforces two conceptual laws:

(a) The basic law of structure, which states that library service must be based on the comprehension of the whole C-M-R relationship, as it is expressed in any given collection, in order to perform specific services to the library's individual user;

(b) The operational law of library service, which points out the fact that the elements within a C-M-R relationship cluster in groups, and therefore act in similar ways, expressing similar group qualities.

Consequently, a C-M-R relationship can be studied both at the theoretical and operational levels.

### 11.6.3 A Discourse.

A discourse is usually conceived as an orderly communication of thoughts. In a theory of librarianship, what is central in such a discourse is a systematic exchange of ideas about the forms in which information contained in a library collection is communicated.

We may distinguish three unique phases in the library communication, roughly corresponding to the traditional classification of logical propositions and their basic assertions: (a) the procedural or actual, (b) the contextual or possible, and (c) the conceptual or necessary conditions of any library discourse.[34]

The process of library communication itself can be described in terms of its three -- now well known to the readers of this book -- basic components:

(a) the carrier of the message, such as a physical book, microfilm, picture, or magnetic tape containing the message, (M);

(b) the receiver of the message, which is expressed in the communication vehicle (R), such as a listener of the tape recording, or a reader of a book or the message on a computer's screen;

(c) the message-oriented content that is being communicated to the receiver of the message in the form of data, information, instruction, etc. (C).

### 11.6.4 Modes of Communication

#### 11.6.4.1 Procedural Mode of Communication in Metalibrarianship

In the procedural phase of communication, the actual interface between the carriers of information and their interpreter is considered in terms of the means-ends sequences, conceived as a chain of successful responses to stimuli, which are constantly reinforced by positive feedback.

Diagrammatically, the process can be illustrated as a spiral of regenerative means-ends relationships [Fig. 11-7].

In this diagram, the first selected means (M1) is more general than the following means (M2); M2 is initiated by the satisfactory completion of M1, and it results in the accomplishment of the end E1. Consequently, the end E2 becomes more specific than the end E1, etc.

If the choice of a means M1 results in achieving an objective E1, then that objective becomes a means for the next objective, causing a response E2M3 . . . etc., until a final means Mn ends in achieving the final objective En.

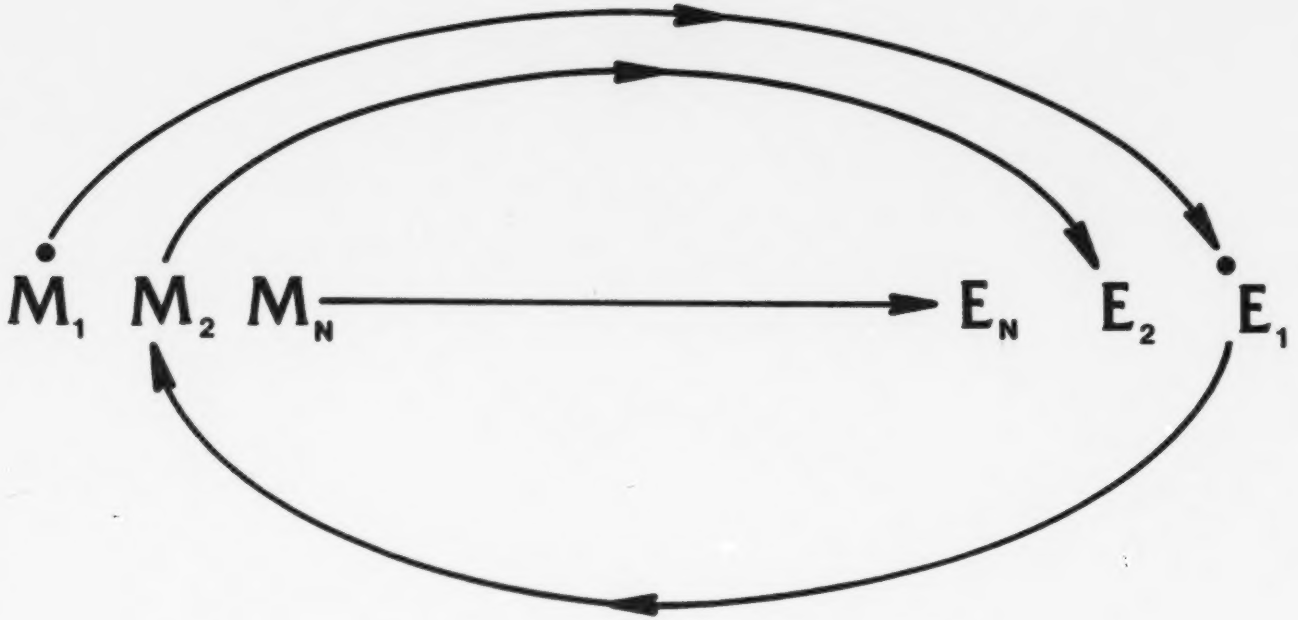
$M_1$
$M_2$
$M_N$
$E_N$
$E_2$
$E_1$

FIG. 11-7: PROCEDURAL MODE OF COMMUNICATION
[Means - Ends Relationship][35]

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The process is one-directional and self-reinforcing. A break in the sequence at any stage of communication interrupts or even completely destroys the communication process itself.

A simple example of the procedural level of library communication is provided in the way a subject heading is read by a student searching for material on, e.g., 'semantics and librarianship.' He chooses a likely subject heading (M1) 'Philosophy of Language' as his first means toward a more specific subject, not yet known to him, that would contain books on the topic searched (En). The subject 'Philosophy of Language' turns out to be too broad, and a cross-reference directs the student to a more specific subject heading 'Language-Philosophy' (E1), which is, again, too broad. After a number of trials, the student comes across the subject heading 'Communication'; this is the final step in this particular search (En), since the titles listed under that heading contain books on library communication and semantics that satisfy his particular need.

The procedural conditions provide an interpersonal phase of library communication. It describes the available means such as books on a given subject in the means-ends process. It is based on a semantical process of perceiving words or symbols as expressed in a message context, describing the outward characteristics of the concept, and thus becoming that concept's fixed referent.

The procedural phase of communication provides also the structure for interpreting the meaning of a given concept in terms of its secondary characteristics. Thus, the procedural approach emphasizes the meaning of the concept expressed in terms of a set of specific operations (e.g., a reading of a book) defined, in turn, by concrete, empirically observable procedures. It is a behavioristic method, verifiable by a manifested response to a given stimulus.

The basic difficulty of the procedural approach in communication is in developing a technique which would allow for an accurate empirical description of the process, making it possible to predict a proper means-ends sequence.

The procedural level of communication in metalibrarianship must be differentiated from the engineering interpretation of communication. In Shannon theory, for example, semantic aspects of communication are irrelevant. The theory deals with the technical problems of mechanical transference of signals, whether they are meaningful or not. But, to quote Weaver, "this does not mean that the engineering aspects are necessarily irrelevant to the semantic aspects . . . information in communication theory relates not so much to what you do say, as to what you could say."[36]

However, in metalibrarianship, the interest in the procedural interpretation of communication focuses on studying how one perceives what one selects, and perhaps, on a more empirical level, how one selects the carriers of communication in order to fulfill one's needs.

### 11.6.4.2 Contextual Mode of Communication in Metalibrarianship

A contextual interpretation of the communication process stresses the concept of need-fulfillment. The process can be sketched as a progressive selection of means available to the library patron and selected by him in order to satisfy his own needs. |Fig. 11-8|

In that diagram the following symbols are used:

N: Specific needs
U: User's end-objectives
R: Available resources
r: a particular resource (e.g., a book) consulted by a reader
i: isomorphism between the user's needs and the resource's potential to fulfill these needs

In this process, the user (U) approaches the collection with a specific need in mind (N); he searches for the fulfillment of the need (F) by consulting the library collection (R). A selected book, or other carrier of information (r), represents broad resources which can be utilized by the reader to satisfy his different types of needs at different stages of the library communication.

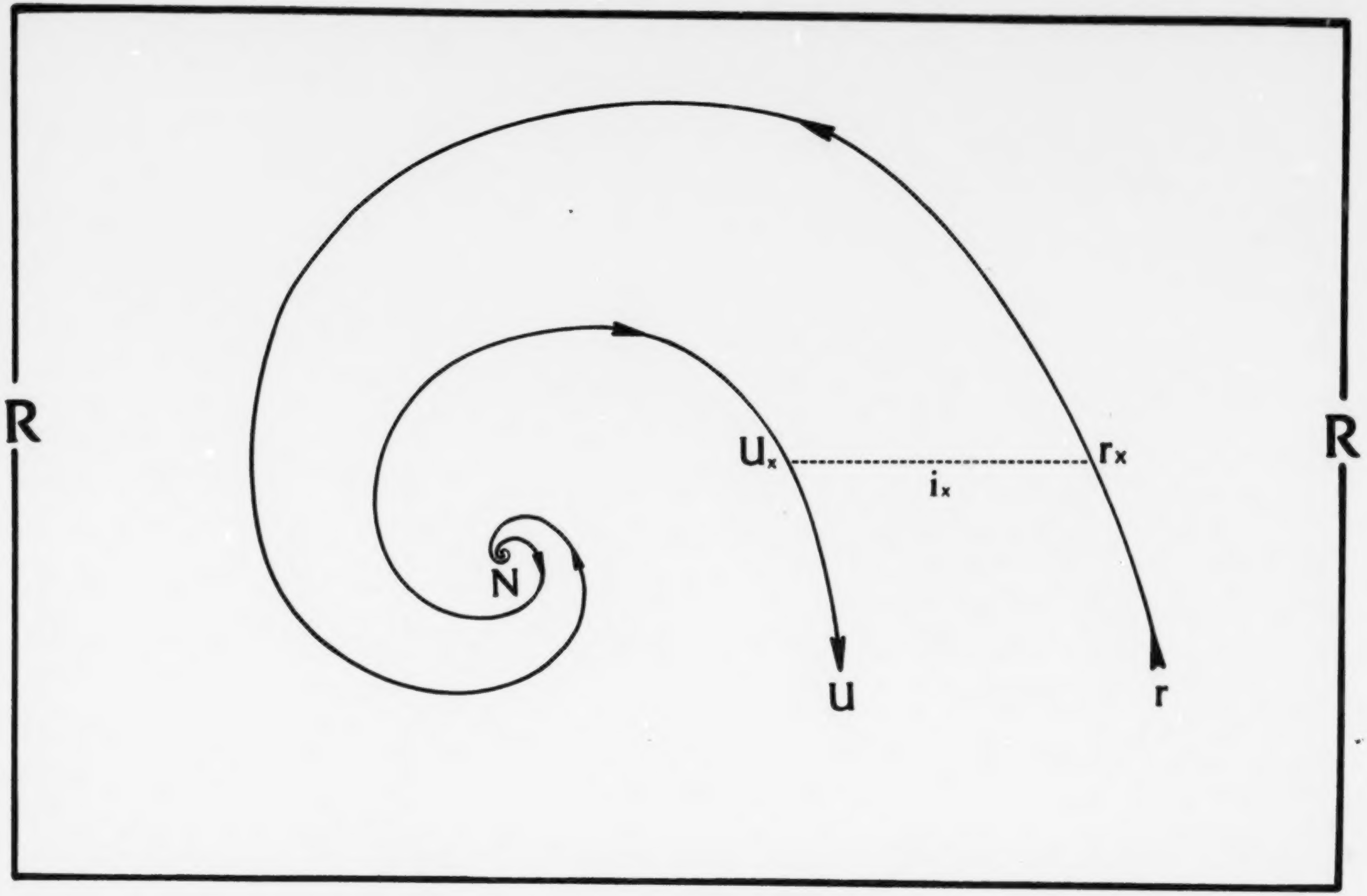

FIG. 11-8: HELICAL REPRESENTATION OF THE CONTEXTUAL PHASE IN COMMUNICATION [The Need - Fulfilment Relations][37]

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FIG.11-8: Helical representation of the contextual phase in communication (The need-fulfillment relationship).[37]

A proper level of isomorphism in the discourse can be described by a formula:

$$I(n-f) = (Un - rn)$$

That is, at any given stage of a C-M-R relationship (e.g., Ux-rx in the above diagram), the user's need is partially satisfied by the amount of information extracted by him from the consulted source. The smaller the isomorphism (i), the more fulfilling is the communication process itself.

The contextual level of metalibrary communication is dependent on a variety of variables, affecting each component of the communication sequence. For example, the concept of communication may be presented at a very simple popularized level easily understood by a causal reader, or it can be defined mathematically in a language understood only by an engineer specializing in communication. Similarly, the message can be formulated in common English or in a professional jargon, each interpreted differently by a novice or an expert.

The contextual condition provides an extra-personal level in metalibrary communication. It describes at any given phase of communication the relationship (or equivalence) between the user's needs and their fulfillment. The relationship is predetermined by the scope of library collection, hence the contextual notion of communication implies a reasoned need-fulfillment relationship.

Library science is concerned not only with the simple reflex behavior involved in choosing the means, but also with the purpose that motivates the individual to select means that are adjusted to particular preconceived need. The discipline ought to be specifically concerned about the criteria used by the reader in accepting or rejecting the services provided to him by the library, thus reflecting a collection's ability to fulfill the user's needs for information. These criteria precede the procedural sequences in communication process and are external to it, since the reader's response to any carrier of communication will take place only if he has a purpose in interpreting these messages. In this sense, a response to a particular sign is considered by a reader as meaningful behavior only because it will facilitate the achievement of a specific goal.

A contextual interpretation of the communicative process stresses the purposefulness of selected need-fulfillment sequences. Both the procedural and contextual processes resemble a trial-and-error method of random search for proper sequences in communication. In both cases, successful attempts are repeated in subsequent trials, while unsuccessful attempts are abandoned. Both processes are essential in the communication pattern formation. They differ conceptually in their emphases: the procedural interpretation stresses the behavioral aspects of the communication sequences, selected a priori, while the contextual approach emphasizes the overall potential structure of communication, and is dependent on the interpretation of the context of the carriers of communication. That is, contextually, the communication process is not a summation of individual need-fulfillment sequences, but a configuration of these responses within a total integrated pattern of thought-structure of any given library user at any particular time.

The problem of contextual interpretation is caused by a lack of satisfactory method of evaluating, and therefore predicting the effectiveness of alternative communication processes.

### 11.6.4.3 Conceptual Mode of Communication in Metalibrarianship

The conceptual approach in communication emphasizes the necessary minimal relationship between the operational, procedural (M-E) and conditional, contextual (N-F) levels of communication. [Fig. 11-9]

In a communicative process, the conceptual approach establishes functional relationships between related concepts, and it is expressed by a combined means-ends, needs-fulfillment interrelationship. The relationship between M:E = N:F can be described graphically as:

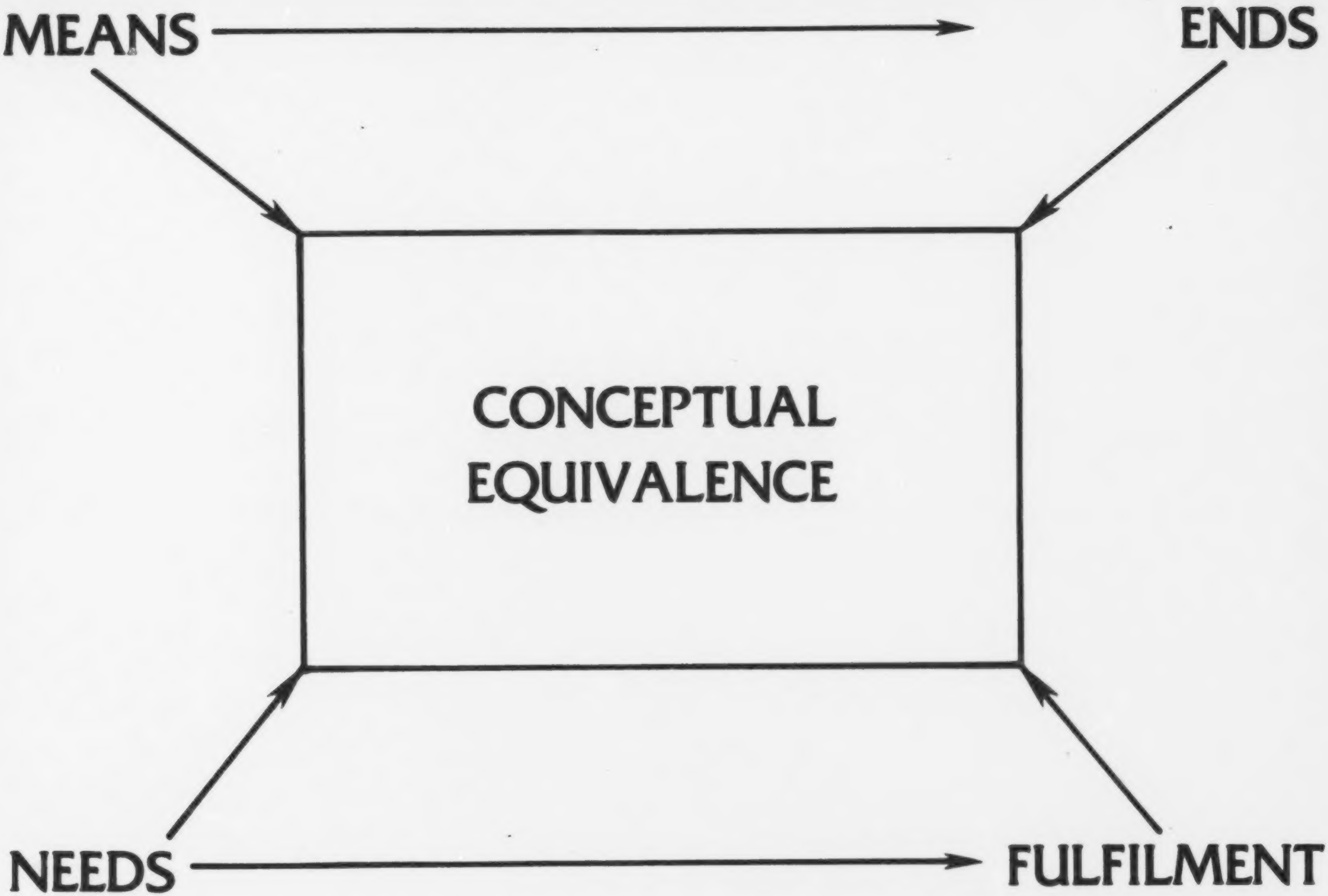
MEANS
ENDS
CONCEPTUAL
EQUIVALENCE
NEEDS
FULFILMENT

FIG. 11-9: CONCEPTUAL EQUIVALENT IN LIBRARY COMMUNICATION
[Means-Ends : Needs-Fulfilment Relations][38]

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M : E = N : F

M-E is a procedural description of the communication process

N-F identifies the possible impact of individual carriers of communication on the fulfillment of needs

M: means

E: ends

N: needs

F: Fulfillment of needs

A purely conceptual analysis of a communication process in metalibrarianship relates M-E and N-F sequences within any transfer of information. It correlates a given method of communication with the meaning that is conveyed by the process. The goal of the library should therefore express the needs of its users. A progress toward achieving these goals is measured in terms of available means, and it is evaluated in terms of satisfactory services, expressed by the fulfillment of the reader's needs.

For example, the conceptual level of metalibrary communication interrelates the student's research in the subject catalog, i.e., a process of finding an appropriate book (M), on a subject of communication (E), with (1) the amount of information contained in a selected book, its accuracy and style of presentation, as well as (2) the reader's own reaction to the material read, and determined, in turn, by the reader's previous knowledge of the subject, an interest in it, etc.

The conceptual interpretation of a communication system aims at a formulation of theoretical relationships between the acts of library users in searching for information and the state of library collections that provides the information. The approach attempts to relate the controlled, behavioristic means-ends processes with the subjective, specific choices of M-E sequences according to the need-fulfillment of an individual library user. What is basic in this process of associating means with goals is the similarity between library material consulted by the user and the information sought by him; and between the concepts which formulate the desired objectives and the actual accomplishments.

11.6.4.4 Examples.

Indirectly, Terbille's essay on the conceptual differences between Waples' empirical pragmatism, Berelson's behavioral approach, and Butler's humanistic viewpoints illustrate the interplay among the three dimensions of librarianship discussed above (Terbille, 1992).

Waples concentrates on research methodology for identifying and solving library problems; "the research should thus serve to confirm or refute the fact, condition, or relationship."[39] Berelson extended the scientific (i.e., procedural) approach to the study of human behavior, limited to the availability of physical evidence (a procedurally tinted contextual approach). Butler recognized three phases in any discipline: technological, scientific, and humanistic; and he criticized the overemphasis in librarianship of the first two. "He argued that the profession needed a humane 'worldly wisdom' to determine what libraries can and should be."[40] He did not reject the scientific approach, but objected to its claim to exclusivity. "A 'chasm' between things as they exist and things as they are known is the common ground of both systems"[41] ( A conceptually based contextualism).

In his other writings, Butler stresses more aggressively the cultural interpretation of reality, thus representing more clearly a contextual viewpoint.

### 11.6.4.5 A Recapitulation

The relationship among the three levels of communication in the metalibrary discourse is summarized in Fig. 11-10:

The end product of the discourse in metalibrary communication is a metaphorical relationship between the descriptions of some aspects of reality, recorded physically in the carriers of the message (be it ideas, facts, or other conceptual messages), and the reality's perception in the mind of the library user in a form of a conceptual reality.

The discourse is satisfactory if it meets the needs of the library user, by expanding or modifying his conceptual perception of reality, and by assimilating new concepts that are communicated to him through the carriers of the message. These carriers provide means available to a library user to meet his goals. Each goal, in turn, is determined by the user's own needs to fulfill

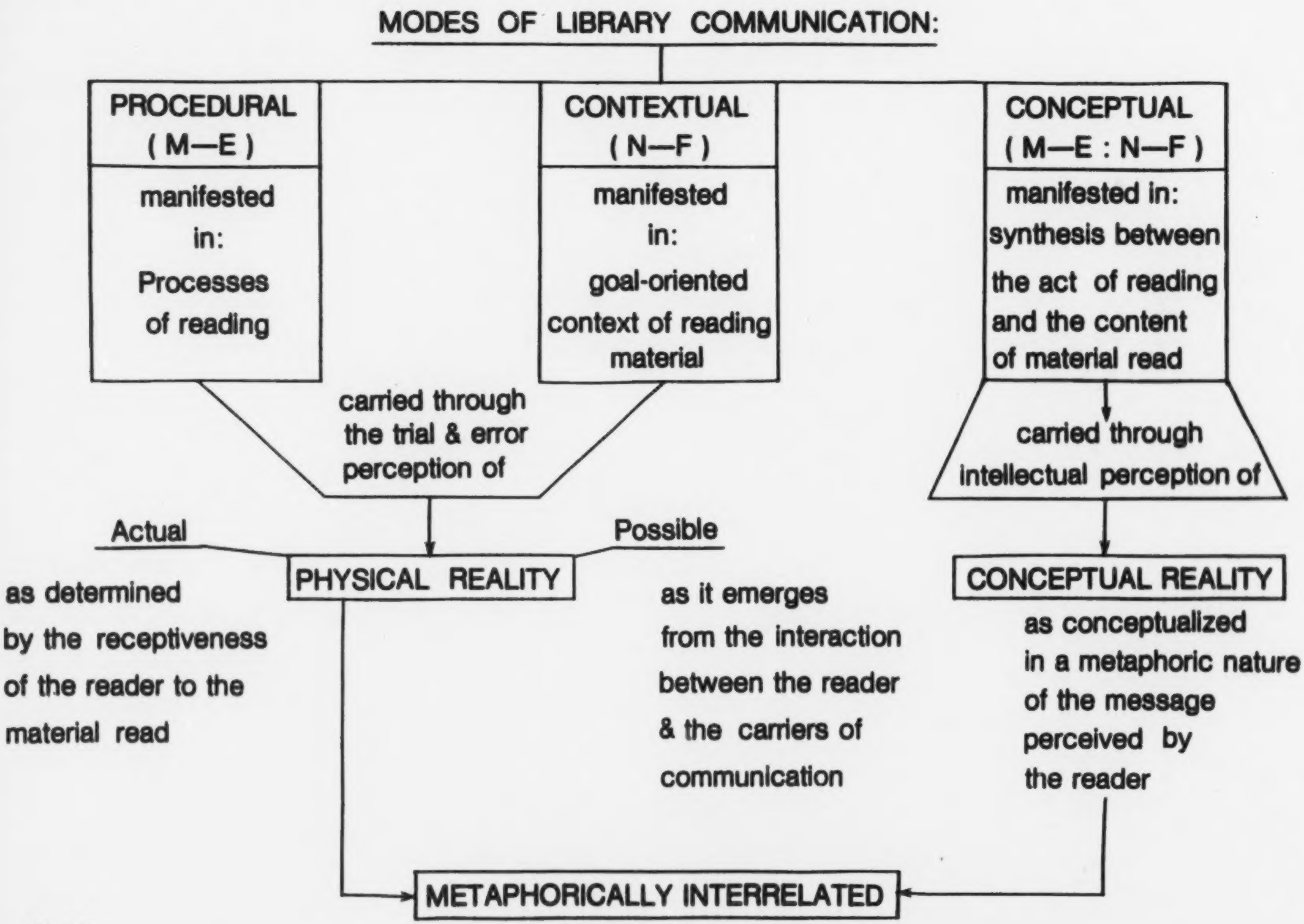
MODES OF LIBRARY COMMUNICATION:
PROCEDURAL ( M—E )
manifested in: Processes of reading
CONTEXTUAL ( N—F )
manifested in: goal-oriented context of reading material
CONCEPTUAL ( M—E : N—F )
manifested in: synthesis between the act of reading and the content of material read
carried through the trial & error perception of
carried through intellectual perception of
Actual
Possible
PHYSICAL REALITY
CONCEPTUAL REALITY
as determined by the receptiveness of the reader to the material read
as it emerges from the interaction between the reader & the carriers of communication
as conceptualized in a metaphoric nature of the message perceived by the reader
METAPHORICALLY INTERRELATED

FIG. II-10: A THREE-FOLD MODALITY OF LIBRARY DISCOURSE[42]

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it at any particular time.

In the vast human knowledge stored in a library collection, an infinite number of conceptual realities waits for their discovery. Thus, library communication is a link between past human accomplishments and their future, unlimited and unexplored potential.

## 11.7 Matrix of Relationships

### 11.7.1 Relationships between Primitive Elements

The diagram [Fig. 11-11] illustrates basic relationships in the d-i-k transfer, between its primary elements, alpha, beta, gamma, considered at three interrelated levels of proceduralism (Pd), contextualism (Cx), and conceptualism (Co).

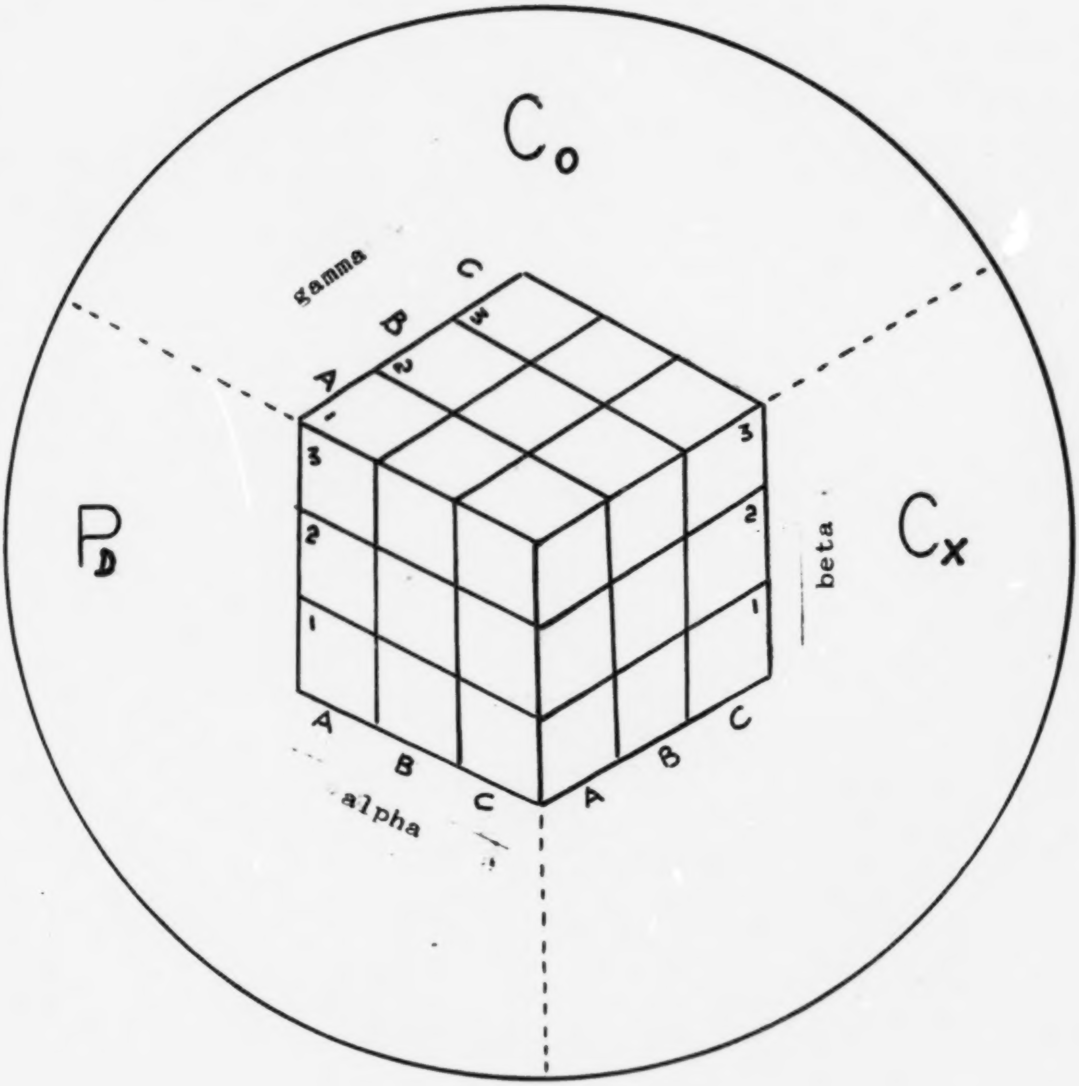
C₀
gamma
A
B
C
1
2
3
P_D
C_X
beta
3
2
1
A
B
C
alpha
A
B
C
3
2
1

FIG. 11-11: MATRIX OF METALIBRARIANSHIP

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Each of the elements is, in turn, described in terms of its configuration within the overall relationship, the processes it is involved in, and its contribution to the definition of the nature of the discipline. (Fig. 11-12)

| Element | A: Configuration | B: Process | C: Quiddity |
|---|---|---|---|
| Alpha | 1. Patron<br>2. Producer<br>3. Librarian | 1. Learning<br>2. Clarification<br>3. Information | 1. Education<br>2. Access<br>3. Assistance |
| Beta | 1. Object<br>2. Event<br>3. Situation | 1. Transfer<br>2. Transformation<br>3. Transmutation | 1. Empirical<br>2. Imaginary<br>3. Abstract |
| Gamma | 1. Oral<br>2. Visual<br>3. Textual | 1. Acquisition<br>2. Organization<br>3. Preservation | 1. Data<br>2. Information<br>3. Knowledge |

Interpreted at procedural (Pd), contextual (Cx), and conceptual (Co) levels

Fig. 11-12: Multiplicity of metalibrary relations

Definitions:

A: Configuration:: Kinds of elements (alpha-beta-gamma):

alpha: The type of participant in the d-i-k transfer

alpha 1: the receiver (library patron)

alpha 2: the producer (author of the message)

alpha 3: the mediator between needs for d-i-k and available resources (librarian) *beta*: The content of the library record in the d-i-k transfer:

beta$_1$ : an object

beta$_2$ : an event

beta$_3$ : a situation

*gamma*: the format of the carrier of the library record:

gamma$_1$: oral

gamma$_2$: visual

gamma$_3$: textual

B: Process: Purposive action toward a specific goal of changing the characteristics of alpha-beta-gamma relations

*alpha*: Processes associated with alpha:

alpha$_1$: learning

alpha$_2$: clarifying

alpha$_3$: informing

*beta*: changes in the status of the record's content which is:

beta$_1$: Transferred to another destination (as a physical signal, code, etc.)

beta$_2$: Transformed, i.e., redefined meaning of the content by changing its form or appearance without changing its quality (e.g., synonymic interpretation of the message) beta$_3$: Transmuted, i.e., substance of the message is changed without changing its appearance (e.g., metaphorical interpretation of the message)

gamma: Processes affecting the carriers of message which are:

gamma$_1$: selected

gamma$_2$: organized

gamma$_3$: preserved

C. QUIDDITY: The essence of d-i-k relationships, its 'whatness,' i.e., the necessary relationships between the configuration (A) and the processes (B) consist of:

alpha: essential services provided to alpha:

alpha$_1$: education

alpha$_2$: access

alpha$_3$: assistance (reference)

beta: essential sources of the content of messages:

beta$_1$: empirical

beta$_2$: imaginary

beta$_3$: abstract

gamma: formats of the carriers of records:

gamma$_1$: data

gamma$_2$: information

gamma$_3$: knowledge

### 11.7.2 Levels of Interpretation

The above relations can be studied at:

Procedural (Pd) level: empirical focus on observable experiences of quantitative, physical properties of reality;

Contextual (Cx) level: psycho-sociological focus on perceived qualitative attributes of reality

Conceptual (CO) level: philosophical focus on logical reality of abstracted ideas about observed and perceived aspects of reality

For example,

on Pd level: a statistical study of relationships between the assistance provided by a librarian (A-alpha $_3$) to a library patron (A-alpha $_1$) in obtaining needed information (C-gamma $_2$)

On Cx level: a study of perceived relationships between visual television images (A-gamma $_2$) and their transmutation (B-beta $_3$) of information (C-beta $_2$)

On Co level: analyses of logical relationships between reported event (A-beta $_2$) and its classification (B-alpha $_2$) in an educational program (C-alpha $_1$).

In the above examples the LIS functions are fulfilled by selected processes (B) within the discipline's structural configuration (A), together defining the substance of the discipline, its essence (C).

### 11.7.3 Examples

The characteristics assigned for alpha-beta-gamma (a-b-g) and for the procedural, contextual, and conceptual (Pd, Cx, Co) levels are arbitrary, and can be substituted by any other sets of values. In our example, the arrangement is as follows:

(1) At the procedural level (Pd) the FORM of each element alpha-beta-gamma describes the nature of each element:

(a1) The participant in the d-i-k transfer may be:

1- Consumer of the message (e.g., library patron)
2- Producer of the message (e.g., author of the message)
3- Mediator between conflicting needs and available resources (e.g., librarian)

(b1) The form of the content of the message (beta) can be either:

1- oral
2- visual
3- textual

(g1) The form of the carrier of records (gamma) can describe:

1- Object

2- Event

3- Situation

(2) At the contextual level (Cx) the FUNCTION of each primitive element, alpha-beta-gamma in the d-i-k transfer consists of:

(a2) The role of the recipient of the message, alpha is:

1- to learn something

2- to clarify something

3- to get information

(b2) The functions of the content of the message (beta) are:

1- to transfer, i.e., to forward the physical signal from the sender to recipient (e.g., forwarding a code, Shannon's signals)

2- to transform, i.e., to redefine the meaning, by changing the form or the appearance of the message without changing its quality (e.g., synonymic interpretation of the message)

3- transmute, change the quality, i.e., the substance of the message, without changing its appearance (e.g., metaphorical interpretation of the message) (g2) The function of the carrier of a message is:

1- to be selected for acquisition

2- to be organized (classified, cataloged, indexed, etc.)

3- to be preserved for future dissemination

(3) At the conceptual level (Co) the ESSENCE of each element describes its constitution, the sum total of its attributes.

(a3) The essence of participant involvement in the d-i-k transfer is:

1- to obtain a specific record (e.g., to charge the book)

2- to expand his understanding (i.e., to be educated on a given subject)

3- to obtain assistance in resolving some conceptual problem

(b3) The essence of the content of the message, beta, can be:

1- Data

2- Information

3- Knowledge

(g3) The essence of the record of the message, gamma, can be

1- Empirical record

2- Imaginary record

3- Abstract record

(4) Each of the above relations can be in turn examined on the procedural (empirical), contextual (environmental) and conceptual (philosophical) level.

The purpose here is to provide a matrix that would accommodate different interpretations of alpha, beta, and gamma within a closely defined environment. The subdivisions suggested here can be substituted or expanded, to allow for designing different frames of comparison. The analyses of information transfer as defined in terms of matrixes, will contribute to the better understanding of reality and a less subjective evaluation of its interpretation.

Furthermore, one may wish to study specific relations among the three levels. For that purpose a different matrix will have to be constructed, listing procedural, contextual, and conceptual levels on each of the three axes of the cubical matrix.

Some of the relations identified in the matrix may be rejected as irrelevant; others may have not yet been identified.[43]

The matrix is hospitable to a variety of alpha-beta-gamma relations. It can accommodate Popper's 'three worlds,' Shera's relationships between 'graphic records-readers-graphic records and readers,' Fairthorne's twenty triads, or any other possible combinations.[44]

## NOTES

1. Otten, K. and Anthony Debons. (January-February 1970). "Towards Metascience of Information: Informatology." *Journal of American Society for Information Science*, 21(1), p. 91.

2. Ibid., p. 92.

3. Kaplan, A. (October 1964). "The Age of the Symbol -- A Philosophy of Library Education." *Library Quarterly*, 34(4), p. 301.

4. Rayward, W. B. (1983). "Library and Information Science; Disciplinary Differentiation, Competition, and Convergence." In F. Machlup, & U. Mansfield (Eds.), *The Study of Information; Interdisciplinary Messages*. New York: John Wiley, p. 350.

5. Mikhailov, A. I., Chernyi, A. I., & Gilyarevskii, R. S. (1969). "Informatics: Its Scope and Methods." In A. I. Mikhailov (ed.), *On Theoretical Problems of Informatics*. Moscow: All-Union Institute for Scientific and Technical Information, p. 14.

6. Taylor, R. S. (1986). *Value-Added Processes in Information Systems*. Norwood, N.J.: Ablex Publishing Corporation, pp. 202-203.

7. Ibid., pp. 49-50.

8. Renaming the discipline is dangerous and not desirable. However, changing the basic perception of the field -- in our case, by expanding its paradigms -- calls for some linguistic differentiation. 'Meta' in the name 'metalibrarianship' suggests a notion of going 'beyond' the subject matter of traditional librarianship. "Informatics,' the term gaining popularity, especially in Europe, does not fit our definition of the new discipline, since it overemphasizes the element of 'information' at the expense of the well-established, and historically justified, designation of the place of our activities, the 'library.' Similar reservation would apply to the use of bibliographic or bibliothecal descriptions of the discipline.

9. In my previous writings I referred to the three components as B (generic book), U (its user) and K (knowledge, or content of the book). The terminology created some confusion, hence the present change.

10. This section is based on Nagel, E. and James R. Newman (1958). *Godel's Proof*. New York: New York University Press; Barker, S. F. (1967). "Geometry," in Paul Edwards (ed.), *The Encyclopedia of Philosophy*. (pp. 285-290). New York: Macmillan Publishing Co., Inc., & The Free Press; and Parsons, C. (1967). "Mathematics, Foundations of," op. cit., pp. 188-213.

11. Nagel, 1958, op. cit., p. 28.

12. Metalibrarianship is about the relations resulting from the manipulation of some concepts within librarianship. Metalibrary statements contain names of the relations studied, not the relations themselves, distinguishing between subject matter under study and the discourse about that subject matter.

13. Nagel, 1958, op. cit., p. 100.

14. Ibid.

15. Godel, K. (1944). "Russell's Mathematical Logic." In Paul A. Schlipp, *The Philosophy of Bertrand Russell*. Evanston and Chicago, p. 137; quoted by Nagel, 1958, p. 100.

16. Nagel, 1958, op. cit., pp. 99-100.

17. Barantsev, R. G. (January 1982). "System Triad of Definition." *Int. Forum Inf. Doc.*, 7(1), p.9.

18. Ibid., p. 10.

19. This test is based on the methodological principle established some twenty-three centuries ago by a Chinese philosopher, Mo Tzu. See: Y. P. Mei (1967) "Mo Tzu," *The Encyclopedia of Philosophy*, 1967, op. cit., vol. 5, pp. 409-410.

20. Pepper, S. C. (1966). *Concept and Quality; A World Hypothesis*. LaSalle, Ill.,: Open Court, p. 6.

21. Popper, K. R. (1979 (rev. ed.). *Objective Knowledge*. Oxford: Clarendon Press.

22. All the above quotations are from Dervin & Dewdney, 1986, p. 507.

23. Brown, R. H. (1987). "Metaphor and Historical Consciousness; Organicism and Mechanism in the Study of Social Change." In R. E. Haskell (ed.), *Cognition and Symbolic Structures: The Psychology of Metaphoric Transformation*. Norwood, N.J.: Ablex Publishing Co., p. 238.

24. Ibid., p. 228.

25. Nitecki, J. Z. (April, 1968). "Reflections on the Nature and Limits of Library Science." In: *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(2), pp. 103-119.

See also: Nitecki, J. Z. (Winter 1979). "Metaphors of Librarianship: A Suggestion for a Metaphysical Model." *The Journal of Library, History, Philosophy and Comparative Librarianship*, 14(1), p. 36.

26. Nitecki, J. Z. (Winter 1981). "An Idea of Librarianship: An Outline for a Root-Metaphor Theory in Library Science." *Journal of Library History, Philosophy and Comparative Librarianship*, 16(1), p. 109.

27. This section is an edited version of Nitecki, J. Z. (June 1970). "Toward a Conceptual Pattern in Librarianship: A Model. " *General Systems Bulletin*, 2(11), pp. 2-16.

28. Boulding, K. (1956). "General Systems Theory - The Skeleton of Science." In *Yearbook of the Society for the Advancement of General Systems Theory*. General Systems, p. 16.

29. Nitecki, J. Z. (April, 1968). "Reflection of the Nature and Limits of Library Science." *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(2), p. 109.

30. Ibid., p. 106.

31. Nitecki, 1970, op. cit., p. 5.

32. The draft version of this section was published in Nitecki, J. Z. (1979-a). *On the Modality of Discourse in the Theory of Librarianship*: ERIC. (ED 171267).

33. Nitecki, 1979, op. cit., p. 3

34. Ibid., p. 5.

35. Ibid., p. 6.

36. Weaver, W. (1964). "Recent Contributions to the Mathematical Theory of Communication." In Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication*. Urbana, Ill.: The University of Illinois Press, p. 8.

37. Nitecki, 1979, op. cit., p. 9.

38. Ibid.

39. Terbille, C. I. (Summer, 1992). "Competing Models of Library Science: Waples-Berelson and Butler." *Libraries & Culture*, 27(3), p. 299.

40. Ibid., p. 298.

41. Ibid., p. 307.

42. Nitecki, 1979, op. cit.,p.13.

43. The total number of combinations possible does not matter here, since the content of the matrix may be changed. What is important is the concept of relationships defined in a specific matrix.

44. The library literature is full of suggested classifications and interpretations of relations between primary library concepts. See, for example, discussion of Fairthorne's triads by Bohnert, L. M. (June 1974), Fairthorne's "Triads as an Aid in Teaching Information Science." *Journal of Documentation*, 30(2), 210-215, and Mooers, C. N. (June 1974). "Analysis of the Hexagon of Notification." *Journal of* Documentation, 30,2.

# CHAPTER 12:
# METALIBRARY IMPLICATIONS

## 12.1 Philosophical Framework

The term 'applied philosophy', often referred in the literature, is an oxymoron, a contradiction in terms, confusing philosophical, critical studies of the nature and meaning of concepts with the theoretical, systematic investigation of their physical appearance, behavior, or technological processes.

On the other hand, the 'philosophies,' e.g., of art, science or technology, refer to the inquiries about the meaning of the concepts involved and how one knows about them. For example, philosophy of art inquires about aesthetic experiences, philosophy of education about theory of learning and its justification, philosophy of religion about religious beliefs and experiences. Philosophy of law addresses the meanings of authority, obligations, law, and order, while philosophy of science scrutinizes the scientific justifications of hypotheses.

Metalibrarianship is developed in the similar tradition of identifying and interrelating basic concepts in library and information science. The assumption is that if the same fundamental relations can also apply to theories about the practical aspects of information transfer, they may serve as common denominators for all fields involved in the communication of the content of recorded information. Selected in this chapter is a review of theories of library management in terms of metalibrary model.

Similar metalibrary analyses can be developed for any other aspects of library information science activities, such as classification, bibliography, or reference. In each instance, metalibrary approach offers analyses of relationships between the essential elements (alpha, beta, gamma) of each subdivision and relevant data-information-knowledge transfer at procedural, contextual, and conceptual levels.

I have chosen a review of library management, since it seems to be implicit in all other subdisciplines of the field. It offers a rationale for all organizational activities, bridging the approaches of the theoreticians, educators and practitioners by offering an interrelated viewpoint.[1]

The philosophical interpretation of the theories of management provides a critical evaluation of the theory and practice of library management. Neither the theory nor the practice of library management can exist without the other. The theory provides hypothetical laws governing management of environment, and it identifies principles describing library practice.

## 12.2. Theories of Management

### 12.2.1 Introductory Definitions [2]

(a) Management

Following the overall theme of this book, management is here considered in terms of relations between three basic approaches: (1) procedural and scientific, focusing on making work more productive and workers more achieving, (2) contextual and human relations-oriented approach addressing the impact of social issues and responsibilities on managing, and (3) conceptual, studying the purposes of the organization.

Management is defined as a process by which a cooperative group directs actions toward common goals of transforming intentions into reality. Drucker, the father of management theory, defined it as a profound human activity, integrating the whole of business enterprise (Drucker, 1974).

The development of theories about management is affected by philosophical speculation concerning the essence of its subject matter (metaphysical), by scrutiny of its structure and validity (epistemological), by examination of its attitudinal implications (ethical), and by evaluation of its contribution to knowledge in a given field, based on logical reasoning.

(b) 'Management Science' is a recently created term which denotes the system of doctrines and broad general principles derived from managerial experiences. It is scientific in its systematic programs for the acquisition, preservation, and interpretation of relevant records. It assumes the existence of some common denominators in all organizations, although it is often applied differently in individual institutions. It is here defined as relationships between scientific (process), behavioral (context), and organizational (concept) theories of management.

Management science is society-bound, eclectic, and viewed as a system; it considers business enterprise as a separate entity in which all parts are interdependent. In the library the term refers to any aspect of library activities (e.g., circulation or bibliographic instructions) considered in terms of the totality of library operations.

(c) Theory of management is a collection of general principles or formulae designed for the purpose of explaining some operational issues. It consists of series of models explaining the relationships within selected phenomena, such as motivational theories. It is an abstraction from practice, identifying principles from which practice proceeds.

(d) Organization is a conceptual unit in which there is a systematic differentiation of parts and functions. It is an entity in itself and has its own rules and life cycle. It can be either a group of people, cooperating in a common effort and delegating controls to few leaders to attain common objectives; or a system, consisting of an environment for people to work in.

Organization is also a complex of the structure-process-people, interrelated in a system. All organizations share the same basic concepts (planning-organization-control); they differ in the ways they interpret these concepts; their implementation is constrained by inner organizational obligations and external circumstances.

Organization supplements human limitations, thus improving efficiency. It differs from the process of organizing, that is, directing and controlling library operations. Organization is an institution (e.g., an information agency as a specific kind of organization). Organizing is an activity of relating the components of an organization into functional entities: a process of assigning authority and relating staff qualifications to job requirements.[3]

The operations of an organization (in the practical view) are determined by relational links between: (a) facts, concepts, and events (theoretical view) and (b) the understanding of the nature of its environment (philosophical view), elaborated further by various specialized considerations (sociological, psychological, economic, etc.)

The concept of management is affected by the types of organizations, whether profit-seeking or not-for-profit (Newman and Wallendar, 1978).

| | INFORMAL | FORMAL |
|---|---|---|
| FOR PROFIT | e.g., Yard Sale | e.g., Banks |
| NOT FOR PROFIT | e.g., Benefit Drive | e.g., Information Agencies |

Fig.12-1: TYPES OF ORGANIZATIONS

Formal organizations are rigidly prescribed, legally constituted with official, standardized work relations. Informal organizations are more flexible and have significant impact on organizational communication (e.g., the grapevine). For-profit and not-for-profit organizations differ in terms of their mission, clients, goals, objectives, and priorities. While their managerial processes are similar, they differ in their application. The services of not-for-profit organization are intangible, difficult to measure, with a multiplicity of objectives; they have weak customers but strong benefactors who frequently influence the management of the institution.

A not-for-profit organization is similar to a for-profit organization in terms of basic managerial concepts; it differs from profit organizations by focusing on services, offered not in the interest of its sponsors, but of its patrons.

An information agency may be either for-or not-for-profit (e.g., illustrated by a distinction between the traditional concept of a not-for-profit public library and some special for profit information agencies).

### (e) Paradigms

Major parameters defining the theory of management are described by major components of the theory: planning, directing, organizing, staffing, and controlling. [Fig. 12-2]

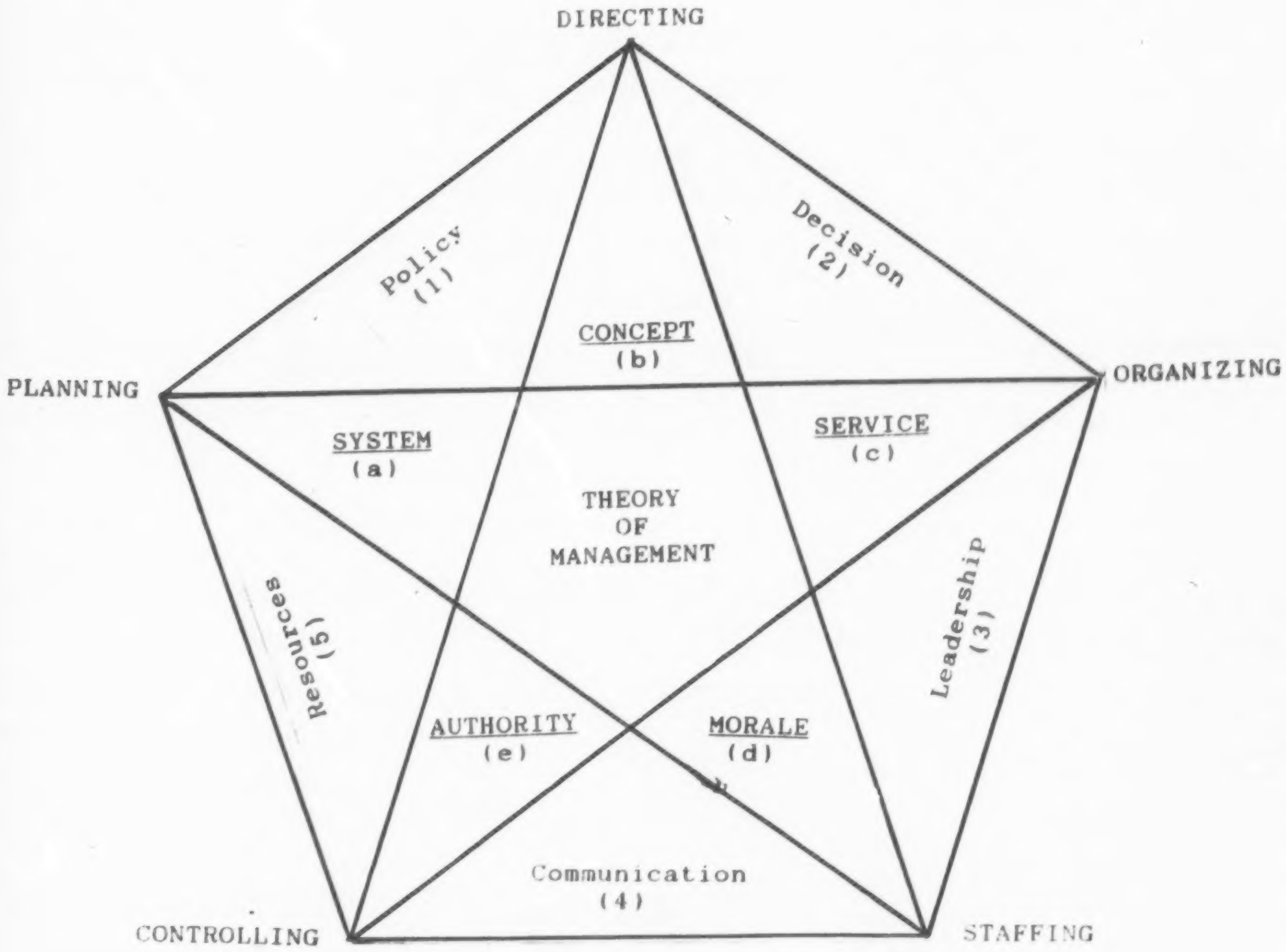

DIRECTING
Policy (1)
Decision (2)
CONCEPT (b)
PLANNING
ORGANIZING
SYSTEM (a)
SERVICE (c)
THEORY OF MANAGEMENT
Resources (5)
Leadership (3)
AUTHORITY (e)
MORALE (d)
Communication (4)
CONTROLLING
STAFFING

FIG. 12-2: MANAGEMENT OF INFORMATION AGENCIES

BEST COPY AVAILABLE

The independent variables interposed between these five pivotal managerial functions include: (1) policy-making (relations between planning and directing), (2) decision-making (based on directing and organizing), (3) leadership (linking organizing with staffing), (4) communication (reflecting staffing and controlling function), and (5) resources (delineated by controlling and planning).

The depended variables are: (a) organizational system, (b) managing concept, (c) service agency, (d) staff morale, and (e) administrative authority. They are influenced by all independent variables to some degree, but primarily by the variables shown in the diagram next to them.

## 12.3 Historical Background [4]

Management has been of concern to organized society throughout civilized history, although its systematic study as a separate branch of human knowledge is fairly recent. [5]

Every concept has its roots in the past. The excavation of Assurbanipal library shows the construction of pigeonholes for storing clay tablets, a predecessor of the 'built-in-book cases' of today and the wall system of shelving. Some clay tablets were very small (one inch long) with writing so minute as to require a reading lens. Some such lenses were also found, serving a function similar to the toady's miniaturization and microformats.[6]

The origin of management goes back to antiquity. It was developed in response to the need to organize and manage society's resources. The increased complexity of operations led eventually to the present crisis management, while in the information sector, the major problem of management becomes the information explosion and its controllability.

The idea of managing collections is associated with the emergence of recorded data (e.g., Sumerian tablets). At that stage, librarians were the keepers of physical records of information.

The concept of management in general must have been well understood seven thousand years ago. The Egyptians of those days planned, managed, and supervised some 100,000 men working for twenty years in building one pyramid; this would be a challenging project even for today's sophisticated management. Another example of managerial knowledge was demonstrated by the military efficiency of ancient armies. Many practices of modern business are traced to military organizations, such as concepts of unity of command, staff advisors, division of work, organization, cooperation, efficient procedures, and controls.[7]

Greek city government had well developed court and administrative systems long ago. Socrates recognized management as a separate skill. Most of the Roman Empire's political success is attributed to their administrative and organizational knowledge and centralized control. Their high level of organizational skill was demonstrated by Hannibal's crossing of the Alps in 218 BC. or Cicero's writings on motion study in 400 BC.

In the Middle Ages (AD 5-16) the Roman Catholic Church emerged as one of the most efficient organizations in the history of Western civilization, with efficient and effective management supported by strong authority. Expanding commerce introduced systematic accounting (double-entry bookkeeping was already known in Venice in 1400), and the concept of cost and revenue, which provided a legal framework for business activities. Increased dependence on wealth contributed to the pragmatic philosophy of life, power manipulation, and individual leadership based on communication skills. The period until the seventeenth century was characterized by authority of a privileged class, with an autocratic style of management resembling the one used by the Egyptians in building the pyramids and by the Chinese in constructing the Great Wall. Both cultures heavily utilized a slave workforce, the exploitation that, some claim, was translated in modern economic theory into a more humane motivation of piecemeal wages. Machiavelli's call for authority based on the consent of the masses was disregarded until our times.

The emergence of physical science and Industrial Revolution (seventeenth to eighteenth centuries) expanded the understanding of the laws of nature, negating the concept of absolute authority and replacing it with the less elitist but equally absolute metaphor of the work ethic.

Technological expansion replaced hand tools with the power -driven machine, producing a factory system which brought workers into a central location and in contact with other workers. 'Division of work' and 'time and motion studies' were discussed by Adam Smith in his *Wealth of the Nation* (1776); Smith introduced the principle of impersonal and objective economy, focusing on the performance of commodities rather than on people's behavior.

The eighteenth century marks a shift from the pre-industrial, independent craftsman to the industrial worker, bound to the organization. The concept of 'entrepreneurship' was introduced and defined by J. B. Say (1767-1832) as a responsibility for directing resources from less to more productive operations.

The first modern assembly line was introduced early in the nineteenth century in England, marking the beginning of coordination, planning, decision making, marketing, and, with it, employer-employee conflict. Large organizations introduced bureaucracy, separating ownership from management, making the latter responsible only for internal operations of the institution.

Weber (1864-1920) visualized bureaucracy as an organization based on rules and standards of codified experiences. He argued for elimination of nepotism, favoritism, and unfair treatment of employees, advocating impersonal, formal conduct, hierarchical authority, with functions clearly identified, defined, and interrelated. Today's negative image of bureaucracy relates to the red tape of processes, not to the concept itself.

In the early twentieth century the focus was on physical factors in production, leading to the emergence of industrial engineering and economics. This was the beginning of the 'Scientific Management Movement' based on a procedural, mechanistic concept of organization emphasizing production, efficiency and prevention of waste.

The years between 1930 and 1960 reflected concern about the human factor in management, the work environment, and relationships between productivity and workers' morale.

Since 1960, management theory has been searching for a balance between scientific and human-relations approaches. Both were concerned about production and people, but with the opposite focus. This marks the beginning of contingency theories developing a holistic approach, interrelating different aspects of management into one theory. This is also the beginning of the library approach to the modern management of libraries.

## 12.4 Theories of Management [b]

The theories of management are of recent origin, reflecting different approaches to the issues of management. Originating as practical engineering concepts of processing and operations, they gradually expanded into a sociological view of workers as a group and psychological study of individual workers. Within each of the approaches, more specific movements developed, each addressing different dimensions of management. Three major groups of theories were cited by Stueart and Moran (1987) and are briefly discussed here: Scientific, Human Relations and Systems.

Each movement was formalized as a separate school of thoughts, representing a unique viewpoint: (1) the operational and universal scientific approach; (2) the behavioral and self-actualizing human relations approach; and (3) the decision-making and General Systems approach.

A need for correlating these dimensions is reflected in holistic approaches of metalibrarianship, emphasizing conceptual similarities among these theories.

| MOVEMENTS | ENGINEERING [ Process ] | SOCIOLOGICAL [ Group ] | PSYCHOLOGICAL [ Individual ] |
|---|---|---|---|
|  | APPROACHES |  |  |
| SCIENTIFIC APPROACH | Scientific Efficiency Taylor<br>Universal Model Fayol | Authority Bureaucracy Weber | Motion Study Fatigue Gilbreths<br>Task & Bonus Gantt |
| HUMAN RELATIONS APPROACH | Behavioral Modifications Skinner | Social Process Follett<br>Informal Group Mayo | Self-Actualizalization Barnard |
| SYSTEMS APPROACH | Decision Making Processes | General Systems Theory Bertalanffy | Psychological Maturation Processes |

Fig. 12-3: Outline of General Theories in Management

### 12.4.1 Scientific Movement

The scientific movement is represented by two major models: industrial engineering, developed by F. W. Taylor, and Henry Fayol's universal model; this was later expanded by Gilbreths and Gantt techniques used for performance appraisal and award incentives.

(a) Engineering Model: Taylor (1880-1927)

(1) The industrial engineering model, also known as the scientific management theory, was influenced by the seventeenth century physical sciences' definition of mass, force, energy, and light, and that century's strong physical world viewpoint. It also reflects nineteenth century's. Protestant work ethic. The model is based on a mechanistic concept of organization focusing on efficiency of organizational operations. The term 'scientific management', introduced by Brandais in 1910, emphasizes maximization of output with minimum waste and inefficiency. It focuses on engineering and psychological aspects of work, motion study, and the merit system (developed later into the performance-appraisal approach). The primary motivation device was an economic use of rewards.[9]

(2) The universal model, also known as the 'classical movement' or the traditional 'universalist' school, was introduced by Henry Fayol in France at the time of Taylor's experimentation in the United States. Instead of focusing on shop operations, it addressed the operations of the whole organization. Its philo-

sophical approach was based on the concept of management as an entity by itself. It shared with Taylor's the same perception of workers as lazy employees, resisting work and requiring discipline and incentive for better performance. However, in contrast to Taylor's operationalism, Fayol considered management as an art, aiming at a search for an ideal structure for the whole organization and for fundamental principles governing its management.[10]

### 12.4.2 Human Relations Movement

In this approach the focus is on understanding the needs and feelings of individual workers, the nature of interpersonal relations, and the role of an informal group. The goal of integrating workers with their working environment led to the emergence of personnel administration and staff participation in organization's affairs. The movement is represented by Skinner's behavioral modification theory, Follett's sociological research, and Barnard's self-realization model.[11]

### (b) Psychological Approach

In 1938 C. Barnard introduced the 'self-actualizing' model, which recommended creation of social groups on the job and democracy in the organization. He also developed the concept of contribution-satisfaction equilibrium between four inducements to work: (1) material rewards, (2) nonmaterial opportunities (e.g., distinction, prestige, power), (3) quality of physical working conditions, and (3) 'ideal benefactions' (e.g., pride or workmanship). His model had a significant impact on motivational theories developed later.[12]

### 12.4.3 Systems Movement (1930s)

This approach is loosely represented by general systems, decision theories and psychological models of individual behavior. Weber's theory of authority and Taylor's focus on efficiency prompted an interest in applying similar theories to the organization viewed as a system.

### (a) General Systems Model.

General systems is really not so much a theory but rather a direction in contemporary philosophy of science, incorporating in one system the viewpoints of biological, physical, and behavioral sciences, mathematics, statistics, and computer science.

General systems developed a systematic approach to any problem -solving processes within the total organization. It perceives the universe as one all-inclusive, integrated system. It stresses the importance of the interactions among all elements comprising that total system. Such an interaction draws from the environment and feeds back to it.

The organization as an open system is made of many subsystems. The model of general systems provides for merging its scientific approach with human relations, focusing on economicotechnical rather than psycho-social aspects and on the use of computers as tools.

(b) Decision Theory Models

This is an interdisciplinary approach, concentrating on decision-making processes perceived as common activity in all other management processes. It aims at a logical and rational process of analyzing decisions, weighing alternatives and their consequences. It prescribes how the decisions should be made and developed management information system (MIS). The system is based on mathematical models for predictions, techniques, governing controls for benefit analysis, game theory, planning, leadership, and motivation.

The model is a useful managerial technique to determine what and how to measure in a given system, in order to improve it by solving its problems. It is limited to economic issues; its primary usefulness is as a technique. It overemphasizes formal aspects of organization, neglecting the impact of individual worker, informal group, and intraorganizational conflicts.

(c) Psychological Model of Individual Behavior

Based on the personality theory, this model stresses the importance of informal standards compensating for weak accountability, low productivity, and poor work-oriented leadership in a bureaucratic system. It advocates job enlargement and assignment of responsibility for job performance to a group. Making a distinction between tasks and socio-emotional functions stimulated increased personal relationships between staff and administration and improves workers' satisfaction.

In this model, organization is considered a psychological tool for the individual's own development. Work becomes an equalizer of the factors affecting workers' job maturation. Unconscious motives affect decision-making processes but also explain irrational behavior.[13]

### 12.4.4 Conclusion

Each of the above theories identified some important aspects of management. The lack of a comprehensive model which would interrelate all these theories may be at least in part rectified by viewing them in terms of the metalibrary approach. As already mentioned, the scientific models closely resemble the procedural approach. Likewise, the human-relation model relates to the environmental, contextual approach; and general-systems viewpoint reflects the conceptual, integrating approach.

## 12.5 Management of Library Resources [14]

Theories of library management provide coordination of various means toward the achievement of the ends in acquisition, preservation, and dissemination of information. The choice and use of means constitute practical aspects of managing the library. The definitions of its ends are based on theoretical interpretations of an 'ideal' library's operations.

The theory of library management can be considered an extension of the philosophy of library information science. It designs the operations aimed at the accomplishment of set goals. Basic questions addressed in managing information include: (a) conceptual: how to relate work performance and environment to the analysis of operations, methods, and staff structure: What are we doing? (b) contextual: how to analyze work environment (i.e., work load, standards, and types of work): Where is it done? Who does it? and (c) procedural question of how to examine work performance and set control procedures and standards of performance: When is it done right? and How well it is done?

Thus, library management can be interpreted at three levels: (a) conceptual planning, describing what one wants to do by setting goals and policies and forecasting their outcome, (b) contextual design of organizational units and jobs, work flow, and vertical and horizontal hierarchy, and (c) procedural coordination and development of cooperation among library units by directing and supervising actions toward required goals within established objectives and standards.

As an organization, the library has as its mission people -oriented service; its goal is to acquire, organize, and disseminate an intangible product, information. The service is professional but sporadic (i.e., not continuous) and not dealing with matters of life and death. The management criterion is user satisfaction, which is difficult to achieve because of the unstable human environment.

Library management focuses on cost-effectiveness. Its decisions are subject to external and internal pressures. Staff control is needed to maintain efficiency of service. Professional authority is based on the consensus.

The objectives of record management are to collect, organize, service, and administer graphic records and to encourage their utilization. It is done in the framework of alpha-beta-gamma relations, that is, anticipating patrons' needs (alpha), and acquiring and making available resources (gamma) within the subject concentration (beta) of the library. Social utility of graphic records is maximized, to paraphrase Shera, by knowledge management toward better understanding of reality.

### 12.5.1 Historical Background for Library Managerial Theory

Emerging concepts of managing information followed the development of management in general, but at a much slower pace. Librarianship possesses a sizable body of operational data, but lacks well-established theory. It often equates that which is analyzed with the recorded observations, ignoring epistemic questions.

Most library theories are pragmatic, rationalizing each individual technique to satisfy librarians' intellectual curiosity. Theories referring to library practice are illustrated by

Joeckel's promotion of scientific management in library operations to study supply and demand for its services (Joeckel, 1932) and Lingam's discussion of relations between decision making and information needs by managers. Lingam developed a matrix that provides a logical framework for identifying what manager's information is needed (Lingam, 1984).

Parker argued that the traditional method of evaluating information projects is based on a return-on-investment model. Information economics addresses nonmonetary and long-range aspects of value to a company. Parker considered information as a foundation of competition for economic benefits based on various classes of risk and uncertainty (Parker, 1987).

Emery focused on library function, explaining its purposeful activity as means of recognition, collection, organization, preservation, and dissemination of knowledge (Emery, 1971).

Merikangas (1987) proposed a model for librarians' and users' cooperation in map making, by compiling bibliographies more directly reflecting the needs of patrons. Foster (1979) described a promotional outlook, viewing the library as a community service. Trenner (1987) concentrated on the definitions of the user-friendly computer.

For a long time, libraries were book-centered. They only recently refocused on the contents of information carriers, and most recently on the information per se. Presently, the capabilities for controlling and manipulating information are growing at an exponential rate which is much greater than that of the information explosion itself. The change was created by the introduction of computers and large-scale integration technology (networks).

Traditional library information-processing is storage-oriented rather than computer-bound, based on a notion that library problems do not require extensive processing of simultaneous equations, but storage of millions of bibliographic records.

The introduction of the memory chip in the early 1970s was a threshold for both the library and computers. Generally speaking, in the pre-1970 era computer technology was not applicable to libraries, except for specialized libraries, in which information handling was of narrow breath, but greater depth, and closer to the computation end of the computer-storage spectrum.

Thus libraries had a very short time to assess the impact of computerization, while the potential of computers' application grew at an incredibly rapid rate. This created a significant managerial problem. There is now a new gap emerging between the information explosion and its management. This is a dramatic reversal in the history of librarianship. Now, the challenge is how to keep up with almost uncontrollable, fast-expanding information.

Nonlibrarians are aware of computer technology growth but not of the accompanying information explosion. All librarians are fully aware of the information explosion, but not yet fully conscious of the implication of the fast-expanding impact of computer on librarianship, often confusing the ways computer and human minds operate. The computer is a formula-driven machine, operating in an algorithmic mode. The human mind, on the other hand, utilizes a heuristic approach; this is a slower and less accurate method, but it addresses broader and much more complex issues. "The computer can manipulate and interpret data and ideas, and retrieve, sort, and analyze them as instructed. But only the human can decide what the computer ought to do and draw conclusions from the work performed by a computer."[15]

Until the 1930s all libraries were relatively small organizations, with a conservative and authoritarian style of management. They were characterized by slow changes, stressed replication of past successful practices in other libraries, and often disregarded the unique environments of each library. After 1937, the libraries caught up with general theories of management.

The scientific approach to management, between the 1930s and the 1950s, started with doctoral dissertations analyzing the cost of technical services and investigating effectiveness of new management techniques. The general focus was on activities rather than people.

The human-relations viewpoint, which began in the 1950s, stressed a democratic, participatory character in library management and its dependence on committees and some staff involvement in decision processes. The success of this approach was weakened by external factors limiting library autonomy and resources, leading to staff cynicism about managerial motives.

### 12.5.2 Theory and Practice of Librarianship

### (a) Relationships to Science

The librarian's expertise is different from, but supplementary to, that of a scientist. It provides not knowledge per se, but the records containing its description, and it facilitated access to these records, replicating each discipline's topography in the classification of records. Whereas the scientist studies the content of records and the academician focuses on the teaching of that content, the librarian addresses the access to the document containing needed information for both the scholar and the teacher.

The practical interrelationships between the basic elements of metalibrarianship, alpha, beta, and gamma, are summarized in the table below.

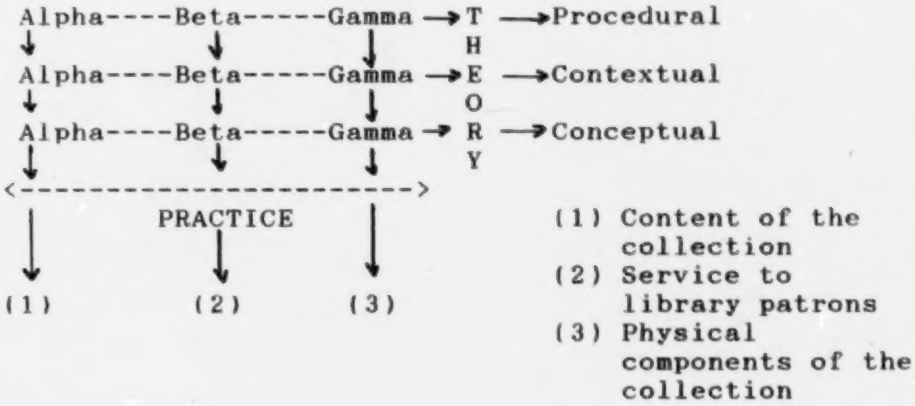

Alpha----Beta-----Gamma → T → Procedural
Alpha----Beta-----Gamma → E → Contextual
Alpha----Beta-----Gamma → R → Conceptual
THEORY
PRACTICE
(1)
(2)
(3)
(1) Content of the collection
(2) Service to library patrons
(3) Physical components of the collection

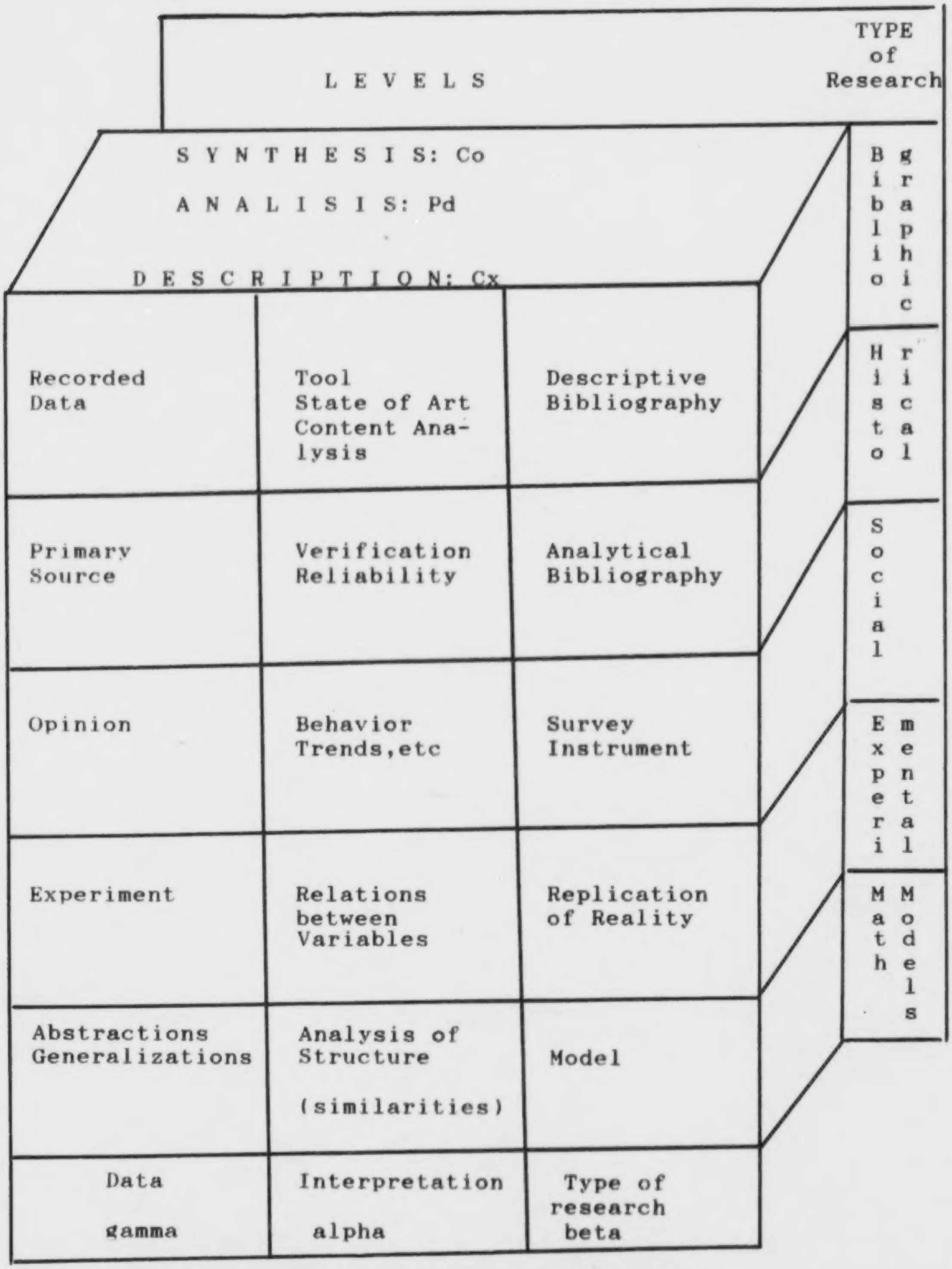
Fig. 12-4: Theory-Practice Relationships in Metalibrarianship [16]

Each of these elements considered horizontally provides one of the three basic dimensions of the theoretical model: the relationships represented by alpha-beta-gamma considered at procedural, contextual, and conceptual levels.

Viewed vertically, each element describes different aspects of library practice: the subject matter covered by library collection and its selection, preservation, and diffusion (beta), the library staff and patrons involved in the use of the library resources (alpha), and the procurement of library resources (gamma).

(b) Relationship to Research

Library research provides a link between the theory and practice of librarianship. It is usually defined as a systematic attempt to discover the modus operandi of a given phenomenon by observation, collection of pertinent data, and interpretation of relationships between them.[17]


LEVELS
TYPE of Research
SYNTHESIS: Co
ANALISIS: Pd
DESCRIPTION: Cx
Bibliographic
Historical
Social
Experimental
Math Models

| | | |
|---|---|---|
| Recorded Data | Tool<br>State of Art<br>Content Analysis | Descriptive Bibliography |
| Primary Source | Verification<br>Reliability | Analytical Bibliography |
| Opinion | Behavior Trends,etc | Survey Instrument |
| Experiment | Relations between Variables | Replication of Reality |
| Abstractions<br>Generalizations | Analysis of Structure<br>(similarities) | Model |
| Data<br>gamma | Interpretation<br>alpha | Type of research<br>beta |

FIG.12-5:Basic Components of Research [18]

The basic components of the research [Fig. 12-5] parallel those of metalibrarianship; they consist of the data representing the records studied (gamma) and their interpretation by the researchers (alpha) in terms of the type of research performed (beta). The results of the research are examined on the descriptive, environmental level (Cx), analyzed at the procedural, analytical level (Pd), and the conclusions formulated at the synthetic, conceptual level (Co).

The relationships between the components of research and their analyses determine the type of research (Hayes, 1987).

(a) Bibliographic research is descriptive, based on recorded (printed) data used as tools. It is employed in studies of a state of art or content analysis of a particular subject.

(b) Historical research utilizes analytical bibliography and relies on primary data evaluated in terms of their reliability and verification.

(c) Social research usually develops survey instruments used to determine behavior or trends as expressed by opinions on a given subject.

(d) Experimental research involves experiments that replicate reality for a study of relationships between variables within the universe of the research.

(e) Mathematical research develops models based on abstract data or generalizations for the identification and evaluation of similarities or differences within researched structures.

Each type of research can in turn be descriptive on its procedural level (the way something is), or aiming at analysis of the research environment by breaking the complex relations into smaller units (why something is the way it is), on its contextual level, or synthesis (drawing conclusions based on causal relations) on its more advanced, conceptual levels.

## 12.6 Conceptual Dimension of Metalibrary Management[19]

### 12.6.1 Metalibrary Model of Management

The model is based on a holistic system of management, considered as a synergetic process. The system is defined as a series of relationships between interacting, dynamic elements, organized together as an integrated, goal-oriented whole.

Managing means arranging relations between energy producing things and events. The energy, in an Aristotelian sense, resides in certain configurations as a potential force. The change in these configurations may 'actualize' the latent or potential energy into an active force. Hence, properly matched events or data affect each other's internal relational structure. A series of such changes constitutes a process, an activity.

Each change introduces a novelty, changing a familiar arrangement into new relations. This results in a tension (e.g., anticipation of an unknown) which in a metaphorical sense creates new energy, accounting for new changes.

Three energy-initiating changes here discussed are: (1) Physical changes are manifested in work actually performed (e.g., book shelving). (2) Psychological changes are evident in motivation and persuasion (e.g., rewards and punishments). (3) Conceptual changes are essential in coordination of managerial activities (e.g., planning or decision-making). What is important in the nature of relations is the process of synergy, in which an aggregated action of different elements produces more effective or efficient results together than each could produce by itself.

Information has already been defined in previous chapters as a component of d-i-k transfer, which can trigger energy (action). The message itself is a product of energy (e.g., the physical energy expended in writing a book). I distinguish here between the conceptual and the supervisory activities of a manager. Conceptual management involves planning means-ends relations, organizing relations between them, and modifying these relationships in response to feedback. Supervisory activities consist of planning specific activities (e.g., scheduling), organizing processing methods, and providing direct control of operations.

The end objective of conceptual management is the creation of new processes; the end objective of supervisory management is the product of these processes.

### 12.6.2 Components of the System [20]

The three main components of a library management system are the resources (gamma), the managerial functions of interrelating library goals with its resources (alpha), and the content of managerial action, its goals (beta). The total structure of the system is affected by planning (Co), organizing (Cx), and coordinating (Pd) each of these managerial functions. It provides basic conceptual activities in managing the library system by changing various relations between library goals and its resources.

Each library system is developed within its own unique environment. Any changes in the internal, intrinsic relationships (between alpha-beta-gamma) or external, extrinsic interpretations (Pd-Cx-Co) affect the total system.

### 12.6.3 Intrinsic Relations

The goals of library management (beta) are defined in terms of relationships between potential information contained in the recorded message (e.g., book) and the degree of satisfying patrons' needs for information.

Library goals are usually defined generically, allowing for adaptation to social changes. Goal displacement may be created by mixing library goals with means of achieving them (e.g., efficiency of operations at the expense of their effectiveness). Goal confusion may also be the result of formulating too broad goals (e.g., goals which lack direction) or goals unrelated to the mission of the parental institution, (e.g., collecting records which are of no interest to the library public).[21]

Managerial functions (alpha) involve planning of policies, development of operational procedures, and coordinating their behavior in an actual library environment. Planning is designed to implement library goals by relating the actual with the desirable library system, to identify the most appropriate services and to meet these goals and their methods.

Policies and procedures are developed in terms of available resources by setting goal-oriented priorities. Coordination of activities reflects the changing environment. It is pragmatic in its concentration on libraries' end-results.

Library resources (gamma) represent means available to the library in accomplishing its goals. They consist of human resources (staff and patrons), physical records (recorded meaning), and supporting facilities (from furniture to financial support). Internal relationships within each resource are determined by the resource's own characteristics.

The three components are fully interrelated: the goals are influenced by the impact of library collections, the profile of its users, and the resulting level of dissemination. The planning is determined by the nature of the organization. It changes the structure of the organization by designing its future goals and by modifying or rearranging its goal's priorities. Processing library resources determines the value of the library itself by changing its utility and staff services. This change significantly impacts on the mission and planning of the library.

The total interrelationships between the above components of managerial functions are directly influenced by the library environment, such as geographical, political, cultural, and economic pressures on the content of collections and on the kind of services offered by the library. Hence no two libraries can be managed exactly the same way, even if their goals, functions, and resources were similar.

### 12.6.4 Three Kinds of Extrinsic Relations

(a) Procedural relations refer to library spatial organization. They determine the location of various components within the library and define the physical structure and boundaries of the library system (e.g., floor arrangement, staff assignments).

Their model is an efficiently run organization. It deals with the physical properties of the library codified in a formal system of rules and regulations that can be measured and experimented with. The procedural dimension is the most frequently researched subject.

(b) Contextual relations refer to temporal changes in the library system, defining the scope of library activities and determining library functions (e,g., processing library material, or answering reference questions). Its model is the duration of the activities and of the relationships between different acts in their context of adjusting, adapting, and coordinating library services to the constantly changing demands for them.

Their major component is the human factor (management, staff and patrons), hence this dimension is of interest in psychological and sociological studies.

(c) Conceptual relations refer to spatio-temporal processes and services in fulfilling the overall mission of the library. They connect library structure with its functions, by relating them, through the planning process, to an ideal concept of what a library ought to be.

Their model is an ideal, hypothetical relationship between the other two elements. It creates pressures for continuous improvement. It is often a focus of historical, comparative, and philosophical research in librarianship, studying similarities and differences between systems developed at different times, in different environments and for different purposes.

### 12.6.5 Relationships among the Three Dimensions [22]

Proceduralism of library structure (Pd) determines the quantitative aspects of library operations by concentrating on the size of the collection, technology, etc.

Contextualism (Cx) represents coordination of library operations, expressed by temporal changes in services and collections; it evaluates the quality and effectiveness of library services, mediates conflicts, and balances contradictory pressures on the system.

Conceptualism (Co) represents a planning process of interrelating the structural processes and temporal services in terms of the institutional goals. In a service-oriented library, the institution's goals will closely relate to expanded library services, with less pronounced technological development. In a highly specialized library, the goals of the institution will be inclined toward the structural aspects of library organization, providing highly advanced information technology, with much less emphasis on user services. Therefore the interrelationships among procedural, contextual, and conceptual approaches in the library system determine the structure, temporary, and ideal character of the library.

None of the three dimensions by itself can fulfill the managerial requirements. A processing center concentrates exclusively on processing library materials; a contextual information agency focuses on specialized issues only, and a conceptual consulting agency offers advice but no service. It is the interrelationship among the engineering, servicing, and planning dimensions uniting them into one interdependent system, which makes the library a unique information discipline.[23]

## 12.7 Summing Up

### 12.7.1 A comparison between Library Information Science, Library Management, and Metalibrarianship

The definitions of library information science, of metalibrarianship, and of library management illustrate the basic similarities and differences between these three interpretations of the field. The table below summarizes the relationships. [Fig. 12-6]

All three approaches are a part of the same overall discourse about data-information-knowledge transfer from the recorded messages to their recipients. Library information science stresses the theoretical aspects of the transfer activities, metalibrarianship focuses on the philosophical relationships, and library management concentrates on the efficiency and effectiveness of d-i-k transfer itself between the basic elements in these activities.

Library information science is the subject of data-information-knowledge transfer research; metalibrarianship is the object of that research, the goal toward which all library management efforts are directed.

| THEORY | MEANING | PRACTICE |
|---|---|---|
| LIBRARY INFORMATION SCIENCE<br>is<br>a study of d-i-k related activities | METALIBRARIANSHIP<br>is<br>a study of relationships between J-ß-Γ and d-i-k transfer | LIBRARY MANAGEMENT<br>is<br>coordination of acquisition, preservation & dissemination of library records |
| Each approach provides a definitions of different aspects of the discipline | | |
| FUNCTION<br>Action toward goal oriented ends | INTERPRETATION<br>Transformation of meaning from message to its recipient | ADMINISTRATION<br>Planning-organization-coordination of library resources |
| STRUCTURE<br>Arrangement of activities in patterns, systems. | CONFIGURATION<br>Nature of elements and their appearances | RESOURCES<br>Recorded messages |
| FORM<br>that of which LIS is made of | ESSENCE<br>of the elements in d-i-k transfer | DIFFUSION<br>of knowledge |
| The three approaches provide: | | |
| Paradigms of d-i-k transfer | Role definitions of d-i-k transfer | Implementation of d-i-k transfer |

Table 12-6. Subject matter of Library Information Science, Metalibrariansip, and Library Management.

It is fashionable today, especially in graduate library schools, to consider information science as the primary subject of the discipline, relegating library science to one of its subdivisions. The distinction between the two branches is valid, but the suggested hierarchy is unnecessary, disregarding the conceptual and historical development of the field.

Information science emerged from library practice similarly to the medical sciences' emergence from medical practice. Both terms, 'medicine' and 'metalibrarianship', stand for metasciences; the former addresses preservation of human health, and the latter is dedicated to the preservation of records of human knowledge. Both are metatheories, studying basic relationships within their own disciplines. Medical and information sciences provide epistemological bases for the practice of physicians and librarians, in hospitals and libraries as their primary locations. Medicine, in its dealing with the matters of life and death, gained societal recognition and a high prestige rating. Librarianship, dealing with the records of human understanding of life and death, still struggles for proper recognition.

### 12.7.2 Toward a Metalibrary Information Science.

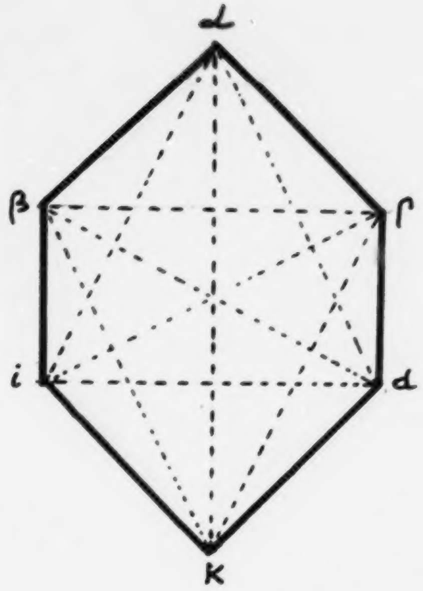
Neither information science nor metalibrarianship is the best name for the philosophical aspects of the redefined discipline of library information science. Each reflects a bias of emphasis, political to establish its scholarly credentials in information science, and cultural to preserve the library role in society in metalibrarianship. So, until a catchier sound-bite is popularized, the term 'metalibrary information science' (METALIS) is tentatively offered as a name for the philosophical bases of the library information science (LIS). METALIS suggests a unity between the library and information-related fields, unified by intellectual processes in expanding the paradigms of the discipline whose basic concerns are the relationships between the recorded thoughts, their creators, recipients, and formats of expression.

The now-emerging eclectic science of information attempts to isolate the unique component of 'information' the presence or absence of which significantly affects various interpretations of reality. This as-yet-nebulous concept has already been adapted in business schools; it reinterprets theories in social sciences, adds intellectual meaning for the otherwise mechanical computerized processes, and commercializes many aspects of learning processes.

While library science focuses on physical records, information science that is related to librarianship concentrates on conceptual records, which emerge from their physical carriers.

By way of a summary for the argument presented in this book, the diagram below (Fig. 12-7) suggests a possible model for METALIS. It outlines the relationships between the root-metaphors of library science (alpha, beta, gamma), with the library-related

1: Internal relations



2: External relations

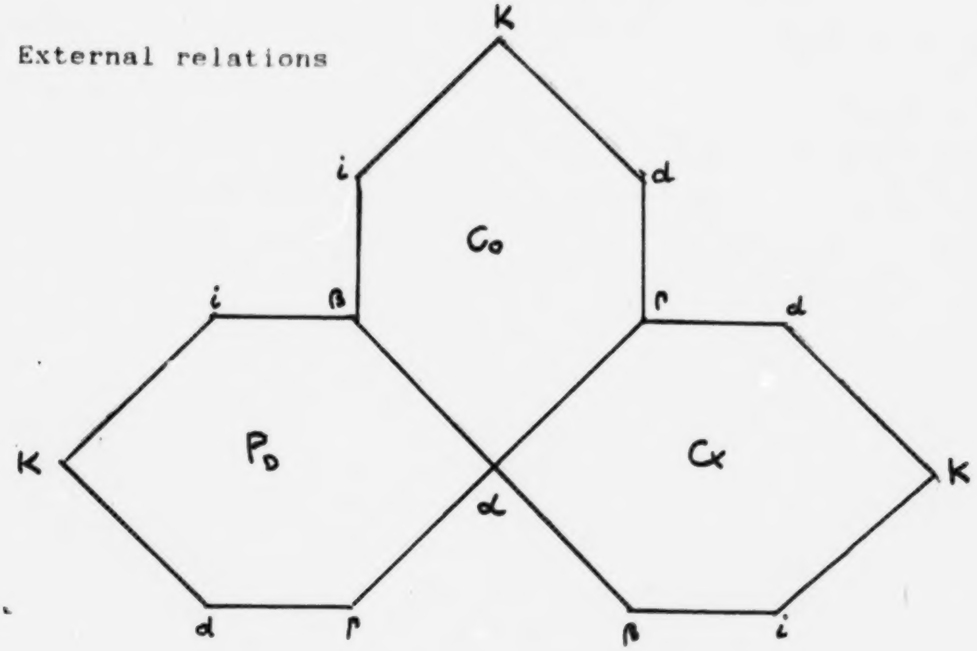

K
i
d
Co
i
β
Γ
d
P_D
Cx
K
K
α
d
Γ
β
i

FIG. 12-7: MAJOR RELATIONSHIPS IN METALIBRARY INFORMATION SCIENCE

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information science's focus on d-i-k transfer. The relationships are analyzed at the primary empirical, environmental, and conceptual levels (Pd, Cx, Co).

As shown in the diagram, each primary component within METALIS (alpha, beta, gamma, data, information, and knowledge) is internally interrelated with all the other components (Fig. 12-7: internal relations). In addition, each cluster of relations, interpreted at the three levels, is interdependent. The process of acquiring new knowledge by the individual (the alpha-k axes) is threefold, reflecting the procedural, contextual, and conceptual relationships between the records involved and their content, relevant to the specific data-information-knowledge transfer. (Fig. 12-7: external relations)

In the present essay, the primary metalibrary relationships within library science (LS) are more fully developed than the corresponding metainformative relations within library related information science (IS). The reason is, of course, historical. The theories in library science were the precursors of the just -now-developing field of information science.

It is the assumption of this essay that in no matter which direction the discipline eventually takes, it will retain some basic characteristics, which define its meta-theory. Primary among them will be the analysis of the structure, order, and form of processes that facilitate the transfer of the requested content of recorded data, information, or knowledge to the individual inquirer.

Tentatively, the proposed metalibrary information science (METALIS) can be defined as a unique discipline which studies the principles (meta-informative) and practices (meta-library) determined by patterns of relationships between recorded d-i-k transfer processes within specific alpha-beta-gamma root-metaphors settings, and synthesized at interrelated Pd-Cx-Co levels of analysis.

## 12.8 Appraisal of Metalibrarianship

### 12.8.1 Critique.[24]

(a) In his "Après Librarianship, Le Metalibrarianship; Comments on the philosophy of Joseph Nitecki" (1980) Bergen raises three objections to my model of metalibrarianship; two deal with infrastructure and one with a superstructure.

Knowledge, Bergen argues, is of a different genus than book and/or user. Hence, the three metaphors of proceduralism, contextualism, and conceptualism may not, Bergen maintains, actually exhaust all possible relationships between alpha-beta-gamma. Proceduralism and contextualism tend to be self-confirming, and hence proceduralism cannot be divorced from contextualism, since they are thesis and antithesis, metaphor and counter-metaphor.

He is also concerned about the complexity of my model; it appears to be more a product of accretion than design. Popper's tripartite epistemology resembles mine: his material, physical world is similar to my 'generic book'; his mental, psychological world (observations, thoughts, and feelings) resembles my 'user'; and his abstract product of mind, the world of theories, myth, etc., is similar to my 'knowledge.' Popper's worlds of mental products and mine of knowledge are Bergen's main issues of disagreement.

Bergen feels that the modern trend is toward dualism (e.g., Chomsky's dyadic linguistic model). He is "suspicious of the notion that knowledge can endure independently of our minds and records . . . I see knowledge and other mental products, however abstract, as contingent rather than autonomous."[25]

His second objection refers to the self-fulfilling nature of my metaphors. Bergen quotes the Feyerabend notion that "hypotheses codify observation so decisively that they are ultimately self-confirming . . . hypotheses are models for, rather than models of, the phenomena they attempt to comprehend . . . Metaphoric thought is essentially analogical . . . some thing or event or process that is known and familiar is like . . . something that is unknown"; it has a heuristic value.[26]

Bergen maintains that the three metaphors do not embrace the totality of librarianship: while proceduralism and contextualism refer to the present, conceptualism refers to the future. As metaphor and counter-metaphors, proceduralism and contextualism cannot be separated and considered independently of psychological impact of alpha-beta-gamma.

Finally, he objects to the excessive complexity of my metalibrarianship and would prefer to reduce the relationships to the book and the user, and "would reorganize proceduralism, contextualism, and conceptualism into a more unified metaphoric tool in which proceduralism and contextualism interact closely as metaphor and counter-metaphor and in which the effectiveness of conceptualism, as it looks to the future, is directly contingent upon the sophistication of that interaction." [27]

Bergen also sees 'jerkiness' and 'disconnectedness' in my model, asking for 'tightening and synthesis'; "somehow . . . the center does not hold."[28] He similarly criticizes me for introducing the three metaphors of proceduralism, contextualism, and conceptualism as means for structuring the relationships between alpha-beta-gamma. According to him, knowledge cannot be a category apart from books and users; and my metaphor is not as metaphysical as I would like it to be, because it always is 'subject to empirical contamination.'

Bergen ties criticism of me with criticism of Wright. He identifies Curtis Wright as "an unabashed admirer of the unadulterated Platonic form in librarianship,"[29] taking a metaphysical approach, detached from library practice.

Fairthorne, similarly to me -- according to Bergen -- "expresses his preference for a librarianship which is as detached from the substance of the world as are . . . removed abstractions that are the symbols of mathematics." [30]

Bergen concludes his criticism by quoting a metaphor of Isaiah Berlin, "who developed the interesting distinction between the 'fox' or pluralist and the 'hedgehog' or the monist, [and he] would undoubtedly consider Nitecki as much of a fox as Aristotle."[31]

Bergen comments suggest a possibility for another version of metalibrarianship. Notwithstanding his criticism of a specific essay of mine, he compares what he read with something he would like to see written instead. In my original essay I interpreted beta (identified there by a symbol 'K') metaphorically as the content of the message, an integrated part of the alpha-beta-gamma relationship. The relationship itself, interpreted metaphorically, aims not at a new concept of knowledge, but is formulated to understand its given meaning within the context of the relationship between the carrier in which it is expressed and the way it is interpreted by the reader of the book.

Furthermore, my theory is not about the explanation of reality, but about validity in any such explanation. Hence, the knowledge in this equation is the content, or subject matter of a selected book, as perceived by its reader. It is not knowledge in abstraction. To avoid the misunderstanding, I have changed the labels in the basic relationships (in the original text 'B-U-K' designated the relationships between a generic book, its user or reader, and knowledge as the content of the book) to more general designations as beta (content of the message), alpha (an interpreter of the message), and gamma (carrier of the message), and I discussed the concept of knowledge in the context of d-i-k transfer.

(b) Fairthorne [32] compares his system of information retrieval with metalibrarianship and criticizes me for concentrating on one triad only instead of his twenty. By confounding under BOOK (gamma) his MESSAGE, CODE, and CHANNEL, I omitted his element SOURCE.

My triad is a confluent case of Fairthorne's triad (Nitecki, 1968). I consider KNOWLEDGE as the subject of the study of the library, while Fairthorne advocates a DISCOURSE. He distinguishes between being informed 'about' (the librarians' task) and 'by' a document (the author's and reader's task).

Both theories use the same strategy by describing two basically different phenomena. He focuses on 'signaling' in Shannon's sense. I stress a meaning expressed by relations between alpha-beta-gamma.

In my model, the concepts of alpha, beta, and gamma are purposefully primitive, undefined terms, since the subject of the study is not the study of any of them, but the relationships among them. Fairthorne searches for basic principles in minimal, analytic theory of information, "to find a smallest black box that we are inside of"; my interest is in the maximal, synthetic theory of librarianship, studying relationships, to use Fairthorne's metaphor, among at least three different 'black boxes.'

We both agree that the subject matter of the generic book itself is not of primary concern in the theory of librarianship; however, I maintain that the relational aspect of the book's subject matter expands the relationships between the primitive terms, alpha and beta. The 'knowledge,' considered as relations known, enters the subject matter of philosophy of librarianship as a content, beta, of the d-i-k transfer. In Fairthorne's model the subject matter of librarianship is a 'discourse.' He defined it as "an orderly communication of thoughts"; to me it is a study of how elements of the alpha-beta-gamma triad affect each other through discourse. His model is in the theory of librarianship --mine is about the theories of librarianship formulated in a philosophy of the discipline considered as a metalibrarianship.

In each of the models, the nature of librarianship is examined through lenses of different focal lengths.

### 12.8.2 Other Comments

Other writers who made some marginal comments on my model were less interested in the philosophical nuances of metalibrarianship than in its interpretative value for other aspects of librarianship.

(a) McInnis, [33] in his discussion of theoretical and conceptual foundations of library instruction, agrees with my premise that "there is no reason why librarianship as a scientific discipline cannot build its own theory, based on . . . metaphorical models"[34] He prefers Pepper's contextual root-metaphor framework over general systems theory in developing his own model and he endorses Wright's and my own belief that "librarianship must be metaphysical rather than scientific."[35]

(b) Engle, [36] in his short essay, endorses metaphysical and metaphorical interpretation of the nonphysical dimensions of librarianship, illustrated by McInnis's bibliographic instruction strategy. He notes that what the patrons seek in the library "is something that can only be characterized metaphorically, although it is grounded in the physical" carriers.[37] Thus a need arises for a philosophy of librarianship that offers "direction for the actions and decisions of daily work and the formulation of long-term goals and objectives."[38] Engle discusses three specific dimensions of the role of librarian: as an intervenor, as a service agent, and as a tolerator of ambiguity, roughly resembling the contxtual, procedural, and conceptual dimensions of librarianship.

(c) Kao Cheng in her two books [39] introduced my theory of metalibrarianship to her Chinese readers. The concept of metalibrarianship is explained in terms of "Sino-Buddhistic branch of philosophy =- 'Wei-shis' or 'Consciousness-only,' or Vijada-nada'."[40]

(d) Rosario Gassol de Horowitz's[41] primary theme is library education in the Third World. In search of a theoretical framework for the discussion, she dedicated one part of her book to the broad review of philosophical issues pertinent to her theme.

In concluding her review. Horowitz referred to meta-librarianship, by saying that "the tridimensional concept of librarianship is a useful perspective in the achievement of professional integration. . . . [It] provides an adequate and flexible framework for the development of theory, research, and curriculum . . . [because it] is in tune with contemporary philosophy and with the multidisciplinary trends and conceptual reformulations . . . [addressing] effectively the merger of technologies."[42]

## 12.9 Epilogue

Humanity began with the discovery of communication in creating culture. Recognizing the ability to modify his environment, man began the technological revolution of remaking the universe. Overwhelmed by his occasional successes and continuous failures, he started reflecting on the meaning of change and became a philosopher. He learned how to respect the wisdom of his predecessors, how to utilize knowledge in his day-to-day struggle, and how to shape the future by passing his experiences on to his successors. He started describing his experiences and recording his thoughts. The concept of the library emerged.

As the proverbial memory of mankind, library collection preserved the records of the past, disseminating their content to the inquisitive patrons and providing resources for inventing the future. As a discipline of learning, the library profession slowly emerged with its own theory of bibliographic reality. As a field of scholarship, library science developed a better knowledge map for guiding the researchers in their pursuit of understanding the universe. By developing procedures for handling the multiplicity of knowledge-records, the library speeded up the process.

First the records of knowledge were acquired, preserved organized, and made available to the public. The reader read the manuscript, sharpening his vision and stimulating his curiosity. He began asking questions. And librarians started searching for the answers, by asking their own questions. The seeds were planted for the philosophy of librarianship. In the last hundred years or so, librarians have reflected on thousands of issues relevant to their profession. For the first time, they shifted their focus from the format of the recorded message to its essence. They called it information, but were unsure of its definition.

The time has come to reexamine the intellectual foundations of librarianship, to develop theories about it, and to build new models. One such effort is presented to the reader with an invitation to further extend the understanding of the knowledge transfer, crudely drafted in this book.

Before completing the intellectual journey, I related the theory of the knowledge transfer to its possible practical application. I have provided illustrations for translating conceptual speculations to the empirical management of ideas, and specifically to the management of knowledge records.

The ancient idea of collecting instigated the growth of cultural resources. Constantly improving technology contributed to the efficient management of records. Librarianship, as a unique discipline, made the use of the records more effective.

The philosophy of librarianship will eventually clarify the essence of librarianship by interrelating its many facets. The social role of librarianship is to maintain the custodianship of human memory. Its psychological responsibility is to protect the collective consciousness of mankind, by selecting the most representative records of both good and bad human efforts, which recorded the civilizations' accomplishments and failures.

But the foremost is the essence of librarianship, its mission to guide the user of recorded knowledge in grasping the meaning of the universe's environment, emanating from the ever-growing documentation of its progress.

Metalibrarianship was thus presented as a meta-library interpretation of relationships between receivers of recorded messages, their content, and format, interpreted at the physical, social, and humanistic levels. This was the theme of this book and is a hypothesis to be developed. I rest my case.

## NOTES

1. See for example my other essays that discuss more specific issues from the metalibrary viewpoint, such as: (a) the negative impact of hypocrisy on librarianship, "The Predicament of Hypocrisy in Librarianship," in May/June 1983 of *Catholic Library World*, 54(10), 406-411; (b) the nature of austerity in library management, in "Creative Management in Austerity," by J. F.Harvey, & P. Spyers-Duran (Eds.), *Austerity Management in Academic Libraries*, 1984 (pp. 43-61), Metuchen, N.J.: The Scarecrow Press.; (c) management and staff morale in "Decision-Making and Library Staff Morale: Three Dimensions of a Two-Sided Issue," *Journal of Library Administration*, (Summer 1984) 15(4), 59-78; (d) the role of common sense in management in: "In Search of Sense in Common Sense Management," *Journal of Business Ethics*, (1987), 6, 639-647; or (e) the impact of the changing information environment on the content of introductory courses in librarianship *Selected Thematic Priorities in American Graduate Introductory Courses to Library and Information Science* (Microfiche: ED331527), Syracuse, N.Y.: ERIC Clearinghouse on Information Resources, 1991.

2. The discussion of general characteristics of management and their replication in a library is based on R. D. Stueart, and Barbara B. Moran (1987), *Library Management*, Littleton, Colorado: Libraries Unlimited (Third Edition).

3. Stueart & Moran, 1987, p. 54, passim.

4. For a more detailed discussion of historical and theoretical aspects of managerial theories summarized here, see Stueart and Moran, 1987, op. cit., pp. 1-16.

5. Ibid., p. 1.

6. Examples listed here were cited in Stueart and Moran, op. cit.

7. Ibid.

8. Descriptions of the theories in this section are based on Stueart and Moran, op. cit., pp. 4-16.

9. The engineering model (1) assumes that workers are motivated by economic rewards and must be prompted to improve quantity and quality of work; (2) it is based on man-machine metaphor, resembling toady's human brain-computer analogies; (3) it is an experimental process (work experience is to be codified and each phase of work studied in detail), (4) it implemented work standards, use of best tools, and reward for above average performance and initiative. Its contemporary expression is in the notion 'cheaper by a dozen,' use of the bonus system for performance above existing norms, and extensive use of planning and scheduling techniques.

10. Fayol's fourteen principles of management consisted of: (1) division of work (specialization), (2) authority (making responsibility commensurate with authority), (3) discipline, (4) unity of command (one boss), (5) unity of direction (one plan), (6) subordination of personal interests to general goals, (7) fair wages, (8) centralization (of supervisor's power), (9) scalar chain (horizontal and advisory in nature communication), (10) order (clear definition of roles and activities in the organization), (11) equity (justice with kindness), (12) stability (low turnover), (13) initiative (use of rewards as incentives), (14) esprit de corps (through communication). Fayol, Henry (1929), *Industrial and General Administration*. Geneva: International Management Institute,

and Fayol, H. (1949). *General and Industrial Management*. New York: Pitman.

11. Mary Follett (1900s) studied the impact of workers' morale on their job performance. She considered management as a social process stressing the importance of direct contact with people and of reciprocity of involvement. Follett, M. P.(1941), *"Dynamic Administration; The Collected Papers of Mary Parker Follett*(edited by Henry C. Metcalf and L. Urwick). New York: Harper's.

12. Stueart, 1987, op.cit., p.12.

13. A good selection of readings on the topics discussed in this section was assembled by Person, Ruth J., ed., *The Management Process; A Selection of Readings for Librarians*. Chicago, American Library Association, 1983.

14. Nitecki, J. Z. (Summer 1980). "Conceptual Dimension of Library Management." *Journal of Library Administration*, 1(2), 47-58.

15. Nitecki, J. Z. (Fall 1983). "Old Ghost in a New Body: Some Misconceptions about Information-Knowledge Relations and the Role of Computers in Academic Libraries". *Research Strategies*, 1(4), p. 152.

16. See also Nitecki, J. Z. (April, 1968). "Reflection of the Nature and Limits of Library Science." *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(2), 103-119; and Nitecki, J. Z. (October, 1968-a) "Reply of Mr. Nitecki to Mr.Fairthorne." *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(4), 369-374.

17. For a succinct definition of the research on which those notes are based, see R. M. Hayes. *Syllabus for Methods of Research Components*, 1987 (mimeograph copy prepared for his graduate students).

18. This diagram is based on research components discussed in Hayes (1987), op. cit.

19. Nitecki, J. Z. (Summer 1980). "Conceptual Dimension of Library Management." *Journal of Library Administration*, 1(2), 47-58.

20. Ibid., p. 51.

21. There is a considerable terminological confusion in the literature concerning some basic concepts. I interpret them here as follow: an aim is a direction of activities, a goal is a target aimed at; an object is the activity under considera-

tion, and an end is a terminal point of those activities. Objectives describe the intentions, purposes, and reasons for action. Obligation is created by circumstances, compulsion, and binding promises; duty is something due because of the nature of a task, or an assignment 'x'. Responsibility is the accountability for the fulfillment of the obligations and duties toward 'x'. Hence, 'X' is aimed at as a target (goal) or as a direction (aim); obligations reflect commitment to 'x'; duty the requirement of; and responsibility the account ability for fulfilling 'x'.

22. Nitecki, 1980, op. cit., p. 56.

23. For a discussion of metalibrary interpretation of ethical issues related to decision-making processes and staff morale see Nitecki, 1984, op. cit. In that essay the relationships between staff morale and decision-making are reviewed in terms of three variables, each providing different dimensions of those relations: (a) operational, conceptual policies, procedures, and rules; (2) ethical, contextual environment determined by mores of an institution, the individuals in it, and the groups they associate with; and (3) procedural, work environment expressed by aggregated attitudes of staff toward administrative decisions (Nitecki, 1984, op. cit.,p. 61) .

24. The critique discussed in this section refers to the essays published before this book, hence the symbols referred to are changed. Some of the criticism might have been answered by the present version of the theory. Unanswered criticism, and any new questions that will be raised by some readers of this book, are passed on to the future researchers in the field.

25. Bergen, D. (1980). *Après Librarianship, Le Metalibrarianship: Comments on the Philosophy of Joseph Nitecki*, p. 7.

26. Ibid.

27. Ibid., p. 13.

28. Ibid., p. 14.

29. Bergen, D. (1981). *The Dialogue of Metaphysics and Empirics; Librarianship as Platonic and Aristotelian.* (Typescript for Charles H. Busha, ed. The Rise of Library Science Theory, p. 12.

30 Ibid., p. 13.

31. Bergen, 1980, op. cit., p. 14.

32. Fairthorne, R. A. (October 1968). "The Limits of Information Retrieval." *Journal of Library History and Comparative Librarianship*, 3, 364-369, and his October 1968 Repartee. *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(4), 363.

33. McInnis, R. (1982)." Do Metaphors Make Good Sense in Teaching Research Strategy?" In C. Oberman, and Katina Strauch (eds). *Theories of Bibliographic Education.* (pp. 47-74). New York: R. R. Bowker.

34. Ibid., p. 47: quoted Nitecki, 1979).

35. Ibid., p. 55.

36. Engle, M. O. (1986)." Librarianship as Calling: The Philosophy of College Librarianship." *The Journal of Academic Librarianship*, 12(1), 30-32.

37. Ibid., p. 31.

38. Ibid., p. 30.

39. Kao, Chin-hsüeh (1985). *T'u shu kuan ch'e hs'ueh chih yen chiu* (A Study of Library Philosophy). Taipei, Taiwan: Shu P'eny Ch'u Pan Sh'e; and her 1989 book: *Chiao se ting wei yu t'u shu kuan chik fa chan* (Roles of the Library and Its development). Taipei: Shu p'engpan She.

40. Kao, 1985, op. cit., p. 288.

41. Horowitz, R. G. de (1988). *Librarianship; A Third World Perspective*. New York: Greenwood Press.

42. Ibid., p. 113.

## APPENDIX 1:
## MAJOR CONTRIBUTORS TO PHILOSOPHY OF LIBRARIANSHIP; Cited by Reviewers of the Library Philosophy.

- Authors are arranged by the earliest citation by:
1:Peirce,1951; 2:McMullen,1957; 3:Mukherjee,1966;
4:McCrimmon,1975; 5:Whitehead,1980; 6:Rogers,1984;
7:McCrimmon,1991; 8:Downs,1969**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1627: Naudé, Gilbert | | | | | | | 7 | |
| 1650: Durie, John | | | | | | | 7 | |
| 1690: Leiniz, Wilhelm | | | | | | | 7 | |
| 1820: Ebert, Friedrich | | | | | | | 7 | 8 |
| 1829: Schrettinger, Martin | | | | | | | | 8 |
| 1837: Panizzi, Anthony | | | | | | | 7 | |
| 1876: Samuel S. Green | | | | | | | | 8 |
| 1887: Dewey, Melvin | | | | 4 | | 6 | 7 | 8 |
| 1906: Dana, John Cotton | | | | 4 | | 6 | | |
| 1907: Bostwick, Arthur R | | | | 4 | | 6 | | |
| 1909: Foss, Sam Walter | | | | 4 | | 6 | | |
| 1915: Putnam, Herbert | | | | 4 | | 6 | 7 | |
| 1925: Meyer, H.H.B. | 1 | | | | | | | |
| 1927: Richardson, Ernest Cushing | | | | 4 | | 6 | 7 | |
| 1931: Borden, Arnold K | 1 | | | | | | | |
| 1931: Ranganathan, S.R. | 1 | 2 | 3 | | 5 | 6 | 7 | 8 |
| 1932: Joeckel, Carleton B. | 1 | | | | | | | |
| 1933: Berthold, Arthur | 1 | | | | | | | |
| 1933: Butler,Pierce | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1933: Shera, J.H. | 1 | | | 4 | 5 | 6 | 7 | 8 |
| 1934: Carnovsky, Leon | 1 | | | | | | | |
| 1934: Danton, J. Periam | 1 | | 3 | 4 | | 6 | | |
| 1934: McDiarmid, E.W. | 1 | | | | | | | |
| 1934: Ortega y Gasset, Jose | | | | | | 6 | 7 | |
| 1934: Wellard, James H. | 1 | | | | | | | |
| 1934: Wilson, Louis R. | 1 | | | | | | | |
| 1935: Bliss, henry E. | 1 | | | | | | | |
| 1935: Cartwright, Morse A. | 1 | | | | | | | |
| 1935: Lane, Ruth McG. | 1 | | | | | | | |
| 1935: Laski, harold J. | 1 | | | | | | | |
| 1935: Orman, Oscar C. | 1 | | | | | | | |
| 1936: Miller, Robert A. | 1 | | | | | | | |
| 1937: Martin, Lowell | | | | 4 | | 6 | | |
| 1938: Johnson, Alvin | 1 | | | | | | | |
| 1939: ALA. Code of Ethics | 1 | | | | | | | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1939: Carnovsky, Leon | | | | | | | | 8 |
| 1939: MacPherson, Harriet D. | 1 | | | | | | | |
| 1939: Predeek, Albert | 1 | | | | | | | |
| 1940: Brown, H. Gleen | 1 | | | | | | | |
| 1940: Clayton, Robert L. | 1 | | | | | | | |
| 1940: MacLeish, Archibald | 1 | | | | | | | |
| 1940: Ogilvie, Ruth A. | 1 | | | | | | | |
| 1941: Bay, j.Christian | 1 | | | | | | | |
| 1941. GLS-Chicago | 1 | | | | | | | |
| 1941: Roberts,H.V,M, | 1 | | | | | | | |
| 1942: Goldhor, Herbert | | | | 4 | | 6 | | |
| 1943: ALA. Post-war standards | 1 | | | | | | | |
| 1945: Kolitsch, Myra | 1 | | | | | 6 | | |
| 1946: Haines, Helen E. | 1 | | | 4 | | 6 | 7 | 8 |
| 1946: Houle, Cyril | 1 | | 3 | | | | | |
| 1946: McCrum, Blanche P. | 1 | | | | | | | |
| 1946: Savage, Ernest A. | 1 | | | | | | | |
| 1946: Wheeler, Joseph L. | 1 | | | | | | | |
| 1947: Burke, Redmond A. | 1 | | | | | 6 | | |
| 1948: ALA. Bill of Rights | 1 | | | | | | | |
| 1949: Broadfield,A. | 1 | 2 | 3 | | 5 | 6 | 7 | 8 |
| 1949: Irwin, Raymond | 1 | 2 | 3 | | | | | |
| 1949: McColvin, Lionel R | | | | | | 6 | | |
| 1949: Temple, Phillips | 1 | | | | | | | |
| 1950: Burke, John E. | 1 | | | | | | | |
| 1950: McColvin, Lionel R. | 1 | | 3 | | | | | |
| 1950: Sayers, Frances Clarke | | | | 4 | | 6 | 7 | |
| 1951: Madden, P.J. | | 2 | | | | | | |
| 1954: Powell, Lawrence Clark | | | | 4 | | 6 | 7 | |
| 1957: Landheer, B. | | | 3 | | | | | |
| 1961: Irwin, Raymond | | | | | | | | 8 |
| 1961: Shaffer, Kenneth R. | | | 3 | | | | | |
| 1962: Foskett, D.J. | | | 3 | | | 6 | 7 | |
| 1962: Snow, Charles | | | 3 | | | | | |
| 1964: Gardner, F.M. | | | 3 | | | | | |
| 1964: Kaplan, Abraham | | | | | | 6 | 7 | |
| 1964: Lyle, Guy R. | | | 3 | | | | | |
| 1964: Nitecki, Jospeh Z. | | | 3 | 4 | | 6 | 7 | |
| 1965: Line, Maurice M. | | | 3 | | | | | |
| 1966: Marco, Guy M | | | | 4 | | | | |
| 1968: Krupskaia, N.K. | | | | | | 6 | | |
| 1969: Harlow, Neal | | | | 4 | | | | |
| 1970: Mokhov, N.J. | | | | | | 6 | | |
| 1971: Shores, Louis | | | | 4 | | | 7 | |
| 1972: Berninghausen, David | | | | | | 6 | | |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1972: MacLeish, Archibald | | | | 4 | | | | |
| 1974: Debons, Anthony | | | | | | 6 | | |
| 1974: Furth, Hans G. | | | | | | 6 | | |
| 1974: Whittemore, Bruce J. | | | | | | 6 | | |
| 1974: Yovits, Marshall C. | | | | | | 6 | | |
| 1974: Otten, Klaus W. | | | | | | 6 | | |
| 1974: Neelameghan, A. | | | | | | 6 | | |
| 1974: Kochen, Manfred | | | | | | 6 | | |
| 1975: Rubanowice, Robert J. | | | | | | 6 | | |
| 1976: Wright, H.Curtis | | | | | | 6 | 7 | |
| 1977: Orr, J.M. | | | | | | | 7 | |
| 1981: Yngve, Victor H. | | | | | | 6 | | |
| No date: Willison, Ian | | | | | | | 7 | |
| Bottasso, Enzo | | | | | | | 7 | |
| Wyer | | | | | | | | 8 |
| Asheim | | | | | | | | 8 |

** Authors mentioned by Downs are listed in the last column, because of a lack of specific bibliographic information about them.

# REFERENCES CITED

Abelson, R. (1967). "Definition." In Paul Edwards (Editor in Chief), *The Encyclopedia of Philosophy* (Reprint edition, 1972). 2 (pp. 314-324). New York: Macmillan Publishing Co., Inc. & The Free Press.

Adams, G.P. at al (1969) eds., *University of California Publications in Philosophy.* New York: Johnson Reprint Corporation.

Aiken, H. D.,ed. (1956). *The Age of Ideology; The 19th Century Philosophers.* New York: The New American Library.

American Library Association. (March 1930). "Suggested Code of Ethics." *ALA Bulletin*, 24, 58-62.

American Library Association. (April 1975). "Statement on Professional Ethics." *American Libraries*, 6, 231.

Anderson, G. A. (March 1988). "The Emergence of the Book." *College and Research Libraries*, 49(2), 111-116.

Apostle, R. and Raymond Boris. (December 1986). "Librarianship and the Information Paradigm." *Canadian Library Journal*, 43(6), 377-384.

Aristotle (1938). *Aristotle selections.* New York,: Charles Scribner's Sons. (Edited with introduction by W.D. Ross).

Arntz, H. (1983). *Information and the Emergence of Man-boundaries in Evolution; Preliminary study for a Palaelogy of information.* The Hague: Federation Internationale de Documentation (FID).

Asheim, Lester. (September 1953). "Not Censorship But Selection." *Wilson Library Bulletin*, 28(1),63-67.

Asheim, L. (October 1968). "My Philosophy of Librarianship." *Library School Review*, 7-8. (A publication of Kansas State Teachers College, Emporia, Dept. of Librarianship).

Asheim, Lester (July 1982). "Ortega Revisited." *The Library Quarterly*, 52(3), 215-226.

Avey, A. E. (1954). *Handbook in the History of Philosophy.* New York: Barnes and Noble.

Bacon, F. (1952). "The Advancement of Learning; Novum Organum; New Atlantis." In *Great Books*. 30 Chicago: Encyclopaedia Britannica.

Bahm, A. J. (September 1973). "General Systems as Philosophy." *General Systems Bulletin*, 4(2), 3-7.

Barantsev, R. G; (January 1982). "System Triad of Definition." *Int. Forum Inf. Doc.*, 7(1), 9-13.

Barker, S. F. (1967). "Geometry." In Paul Edwards (ed.), *The Encyclopedia of Philosophy*. op.cit., pp. 285-290).

Barnard, C. I. (1938). *The Functiuons of the Executive*. Cambridge, Mass.: Harward University Press.

Battin, P. (Summer 1984). "The Electronic Library - A Vision for the Future." *Educom Bulletin*, 12-17,34. (Paper based on a presentation given at the 4th Annual Columbia University Lectures in Computer Science, April 2, 1984).

Bawden, D. (1986). "Information Systems and the Stimulation of Creativity." *Journal of Information Science*, 12(5), 203-216.

Bay, J. C. (1931). "Every Serious Voice Deserves a Hearing." *Library Journal*, LVI, 748-50.

Bay, J. C. (1941). *The Fortune of Books*; Essays, memories and prophecies of a librarian. Chicago: Walter M.Hill.

Beagle, D. (March 1988). "Libraries and the 'Implicate Order': A Contextual Approach to Theory." *Libri*, 38(1), 26-44.

Beardsley, M. C. (1967). "Metaphor." In P. Edwards (ed.), *The Encyclopedia of Philosophy*. 5, op.cit., pp. 284-289).

Bekker, J. (1976). *Professional Ethics and Its Application to Librarianship*. Unpublished doctoral dissertation, Case Western Reserve University.

Belkin, N. J., and Robertson, Stephen E. (July-August, 1976). "Information Science and the Phenomenon of Information." *Journal of American Society for Information Science*, 27(4), 197-204.

Belkin, N. J. (March 1978). "Information concepts for Information Science." *Journal of Documentation*, 34(1), 55-85.

Bellomy, F. L. (October 1968). "The Systems Approach Solves Library Problems." *ALA Bulletin*, 62(9), 1122-1125.

Benge, R. C. (1970). *Libraries and Cultural Change.* London: Archon Books,Clive Bingley. (Simultaneously published in the USA by Archon Books,The Shoe String Press).

Bennett, G. E. (1988). *Librarians in Search of Science and Identity: The Elusive Profession.* Metuchen, N.J.: Scarecrow Press.

Bergen, Daaniel P. (1963) "The Anthropocentric Needs of Academic Librarianship." *College and Research Libraries*, 24(4) July 1963, 277-290,307-308.

Bergen, Daniel P. (1963) "Librarians and the Bipolarization of the Academic Enterprise." *College and Research Libraries*, 24(6), November 1963, 467-480.

Bergen, Dan (1965) "Implications of General Systems Theory for Librarianship and Higher Education." Paper prepared for delivery at the Program of the Society for General Systems Research, Annual Meeting of the American Association for the Advancement of Science, Berkeley, California, December 30, 1965. (n.p.)

Bergen, D. (July 1967). "The Communication System of the Social Sciences." *College & Research Libraries*, 239-252.

Bergen, D. (January 1978). "Use of Social Science Literature -- Review." *The Library Quarterly*, 48(1), 90-92.

Bergen, D. (1980). "Après Librarianship, Le Metalibrarianship: Comments on the Philosophy of Joseph Nitecki." Critique presented at the University of Texas, Austine Conference, 1980. (n.p.)

Bergen, D. (1981). "The Dialogue of Metaphysics and Empirics; Librarianship as Platonic and Aristotelian." (Typescript for Charles H.Busha, ed. The Rise of Library Science Theory (n.p.)

Bergen, D. P. (November 1983). "Librarians and the Bipolarization of the Academic Enterprise." *College & Research Libraries*, 24(6), 467-490.

Bergson, H. 1. (1952). "Creative Evolution." In Benjamin Rand (Compiler.), *Modern Classical Philosophers*(2nd enlarged ed.). (pp. 852-885). New York: Houghton, Mifflin Co., (Translated from French by Arthur Mitchell).

Berlin, Isaiah (1956). *The Age of Enlightenment.* New York, New American Library.

Berlin, Isaiah. (1978). "The Hedgehog and the Fox." In I. Berlin, *Rusian Thinkers.* (pp. 22-81). New York: Viking Press.

Berlyne, D. E. (1984). "Thought Processes, Theories of." In *The New Encyclopaedia Britannica* (15). 18 (Macropaedia). (pp. 352-354). Chicago: Encyclopaedia Britannica, Inc. (Knowledge in Depth).

Berninghausen, D. (November 15,1972). "Social Responsibility vs. The Library Bill of Rights." *Library Journal*, 3675-3681.

Berry, J. (August 1987). "What's In a name?" *Library Journal*, 112(13), 4.

Bertalanffy von, L. (1950). "An Outline of General System Theory." *British Journal for the Philosophy of Science*, 134-165.

Berthold, A. (October 1933). "The Science of Librarianship." *Wilson Bulletin*, 8, 120-121. ("The Young Librarian; A Forum of Independent Opinion "Section edited by Arthur Berthold).

Best, D.P. (1988). "The Future of Information Management." *International Journal of Information Management*, v.8, pp.13-24.

Bierbaum, E.'G. (January 1990). "A Paradigm for the '90s." *American Libraries*, 21(1), 18-19.

Bliss, H. E. (1935). "As to a Philosophy for Librarianship." *Library Quarterly*, 232-235.

Boaz, M. (January 1972). "Some Current Concepts About Library Education." *College & Research* Libraries, 33(1), 18-23.

Bohm, D. (1957). *Causality and Chance in Modern Physics.* London: Routledge & Kegan Paul.

Bohm, D. (1980). *Wholeness and the Implicate Order.* London: Ark Paperbacks.

Bohnert, L. M. (June 1974). "Fairthorne's Triads as an Aid in Teaching Information Science." *Journal of Documentation*, 30(2), 210-215.

Bookstein, A. (Summer/Fall 1979). "Explanations of the Bibliometric Laws." *Collection Management*, 3(2/3), 151-162.

Boorstin, D. J. (September 1982). "Homo Up-to-Datum Is a Dunce." *Reader's Digest*, 54-56.

Boorstin, D. J. (1983). *The Discoverers*. New York: Random House.

Boorstin, D. J. (1985). "Books Go Public." In D. J. Boorstin, *The Discoverers*. (pp. 533-538). New York: Vintage Books.

Borden, A. K. (April 1931). "We Need a Philosophy." *Libraries* 36, 175-176.

Bostwick, A. E. (1907). "The Love of Books as a Basis for Librarianship." In B. McCrimmon (Editor.), *American Library Philosophy; An Anthology* (Reprinted from *Library Journal* 32(Feb.,1907,pp.51-55]). (pp. 20-30). Hamden,Conn.: The Shoe String Press.

Bottasso, E. (January-April, 1952). "La Filosofia del Bibliotecario." *Accademiie e Biblioteche d'Italia*, 20, 31-38.

Boulding, K. (1956). "General Systems Theory - The Skeleton of Science." In *Yearbook of the Society for the Advancement of General Systems Theory*. 1 (pp. 11-17).

Boyce, B. R., and Donald H. Kraft. (1985). "Principles and Theories in Information Science." *Annual Review of Information Science and Technology*, 20, 153-178.

Bretz, R. (1971). *A Taxonomy of Communication Media*. Englewood Cliffs,N.J.: Educational Technology Publications.

Broadfield, A. (1946) *The Philosophy of Classification*. London: Grafton.

Broadfield, A. (1949). *A Philosophy of Librarianship*. London: Grafton.

Bronowski, J. (1978). *The Origins of Knowledge and Imagination*. New Haven: Yale University Press.

Brookes, B. C. (February 1984). "Popper's World." *Journal of Information Science*, 8(1), 39-40. (Letters to the Editor column).

Brown, H. G. (September 1,1940). "Disagrees with MacLeish Point of View." *A.L.A. Bulletin*, 34, 482.

Brown, R. H. (1987). "Metaphor and Historical Consciousness; Organicism and Mechanism in the Study of Social Change." In R. E. Haskell (ed.), *Cognition and Symbolic Structures: The Psychology of Metaphoric Transformation*. (pp. 225-240). Norwood, N.J.: Ablex Publishing Co.

Bryson, E. R. (1970). *A Theory of Librarianship.* Unpublished doctoral dissertation, University of Kentucky, Lexington, Kentucky.

Buckland, Michael K. (1983) *Library Services in Theory and Context.* New York: Pergamon Press.

Buckland, Michael K. (1991) *Information and Information Systems.* New York: Praeger.

Burke, R. A. (October,1947). "Philosophy of Librarianship." *Catholic Library World*, 19, 12-15.

Burke, R. A. (1953). *Culture and Communication Through the Ages.* Preliminary edition. (manuscript) (The book began as a joint endeavor with Pierce Butler).

Burr, R. L. (January 1975). "Library Goals and Library Behavior." *College & Resarch Libraries*, 36(1), 27-32.

Butler, P. (1933). *An Introduction to Library Science.* Chicago: The University of Chicago Press. (First Phoenix Edition, 1961. With an introduction by Lester E. Asheim).

Butler, P. (1943). "Survey of the Reference Field." In P. Butler (Editor.), *The Reference Function of the Library.* (pp. 1-15). Chicago: University of Chicago Press. (Papers presented before the Library Institute at the University of Chicago, June 29 to July 10,1942).

Butler, P. (1944). *Scholarship and Civilization.* Chicago: Graduate library School, University of Chicago.

Butler, P. (October 1945). "The Intellectual Content of Librarianship- A Review." *Library Quarterly*, 15, 347-351. (Review Article of Handbuch der Bibliothekswissenschaft).

Butler, P. (October 1951). "Librarianship as a Profession." *Library Quarterly*, 21(4), 235-247.

Butler, P. (April 1952). "The Cultural Function of the Library." *The Library Quarterly*, 22(2), 79-91.

Butler, Pierce (1953). "The Life of the Book." *Library Quarterly*, 23(July, 1953): 157-163.

Carbonell, J. G. (1982). "Metaphor: An inescapable phenomenon in natural language comprehension." In W. A. Ringle Lehnert (eds.), *Strategies for Natural Language Processing.* (pp. 415-434). Hillsdale, NJ: Erlbaum..

Carnovsky, L. a. McDiarmid,E.W. (January 9,1934). "Suggested Program for Junior Members." *The Library Journal*, 59, 32-33. ('The Open Round Table' column.)

Carnovsky, L. (January 1950). "The Obligations and Responsibilities of the Librarian Concerning Censorship." *Library Quarterly*, 20, 21-32.

Carnovsky, L. (1962). "Preparation for the Librarians Profession." *Library Quarterly*, XII, 406.

Carter, G. A. (July-August,1948). "A Century of Public Libraries." *Library World.*

Chan, W.-T. (1967). "Chinese Philosophy." *The Encyclopedia of Philosophy*, op.cit., 2, 87-96.

Chisholm, M. (November/December 1985). "The Librarian as Educator." *Catholic Library World*, 57(3), 117-121.

Christ, J. M. (May 1969). "Functional Analysis and Library Science." *College & Research Libraries*, 30, 242-246.

Christ, J. M. (1972). *Toward a Philosophy of Educational Librarianship*. Littleton, Colo.: Libraries Unlimited.

Clayton, R. L. (February 1940). "The Spirit of Librarianship." *Library Assistant*, 33, 27-31. (A discussion of S.C. Holliday's article "The Librarian - A Literary Gent?")

Cohon, S. S. (1950). "Ancient Jewish Philosophy." In Vergilius Ferm (ed.), *A History of Philosophical Systems.* (pp. 57-69). New York: The Philosophical Library.

Coney, D. (July 1939) "Review of Library of Tomorrow," E.M. Danton (ed.); a symposium. *Libray Quarterly*, 9, 342-4.

Cooney, J. P. (October 1987). "What is Information Really Worth?" *Canadian Library Journal*, 44(5), 293-297.

Cotterell, A. (1980). *The Encyclopedia of Ancient Civilizations.* New York: Mayflower Books.

Cotton des Houssayes, J. 1. (1780). "Des Devois et Des Qualites du Bibliothecaire. in J. D., Wayne Shirley and Louis Shores Marshall (comp.), *Books, Libraries, Librarians*; *Contributions to Library Literature.* (pp. 272-277). Hamden, Connecticut: Shoe String Press, 1955.

Crawford, D. (November 1986). "Meeting Scholarly Information Needs in an Automated Environment: A Humanist's Perspective." *College & Research Libraries*, 47(6), 569-574.

Creil, H. G. (1950). "Chinese Philosophy (Confucianism, Moism, Taoism, Legalism)." In V. Ferm (ed.), *A History of Philosophical Systems*, op.cit., pp. 44-56.

Curras, E. (1984). "Moral and Social Implications of New Technologies in Information Science." In A. Van Der Laan, & A. A. Winters (Editors.), *The Use of Information in a Changing World.* The Hague. (pp. 417-432). Amsterdam: North-Holland.

Daily, J. (1957). *The Grammar of Subject Headings: A Formulation of Rules for Subject Heading Based on a Syntactical and Morphological Analysis of the Library of Congress List.* Unpublished doctoral dissertation, Columbia University, New York.

Daily, J. (1972). "Poor Fools." *Library Journal*, 97, 2811-2815.

Dana, J. C. (1906) "Many-Sided Interest: How the Library Promotes It." In B. McCrimmon (Editor.), *American Library Philosophy; An Antology.* (pp. 10-19). Hamden,Conn.: The Shoe String Press. (Reprinted from School Journal, December 22,1906).

Danton, J. P. (October,1934). "Plea for a Philosophy of Librarianship: Philosophia vero omnium mater artium." *Library Quarterly*, 4, 527-551. (Reprinted in B.McCrimmon, American Library Philosophy, op.cit., pp.63-87.

Danton, J. P. (June 1941). "University Librarianship; Notes on Its Philosophy." *College & Research Libraries*, 2(3), 195-204.

Debons, A. (1974). *Information Science; Search for identity.* New York: Marcel Dekker. (Proceedings of the 1972 NATO Advanced Study Institute in Information Science held at Seven Springs, Champion, Pennsylvania, August 17-20,1972.)

Debons, A. (November 1978). *Determining Information Functions*, Discussion Paper, NSF Manpower Survey Project DS1-7727115.

Dervin, Brenda et al. (1976) "The Development of Strategies for Dealing with the Information Needs of Urban Residents; Phase I - Citizen Study." Final Report to the *Office of Education*, April 1976.

Dervin, Brenda and Patricia Dewdney. (Summer, 1986). "Neutral Questionning: A New approach to the reference interview." *RQ*, 25(4), 506-513.

Dervin, B. (1992). "From the Mind's Eye of the User: The Sense-Making Qualitative-Quantitative Methodology." In J. D., and Ronald R. Powell Glazier (eds.), *Qualitative Research in Information Management.* (pp. 61-84). Englewood, Colorado: Libraries Unlimited, Inc.

Dewey, M. (1898) "The Relation of the State to the Public Library." In B. McCrimmon (Editor.), *American Library Philosophy; AnAntology.* (pp. 1-9). Hamden,Conn.: The Shoe String Press, 1975 (Reprinted from the Transactions and Pro ceedings of the Second International Library Conference,1898)

Dewey, J. (1933). *How We think; A Restatement of the Relation of Reflective Thinking to the Educative Process.* Boston: D.C.Heath.

Dewey, M. (September 30,1876). "The Profession." *Library Journal*, 1(1), 21-23. (Also in Landmarks of Library Literature)

Diener, R. A. (Jun-Jul, 1989)." Information Science: What It Is? ...What Should It Be?" *Bulletin of the American Society for Information Science*, 15(5), 17.

Dimock, M. E. (1939). "The Place of Organization in Intitutional Development." In C. B. Joeckel (ed.), *Current Issues in Library Administration.* (pp. 66-89). Chicago: University of Chicago Press.

Diringer, D. ([1947]). *The Alphabet; A Key to the History of Mankind.* London: Hutchinson's Scientific and Technical Publications.

Ditzion, S. H. (1947). *Arsenals of a Democratic Culture.* Chicago: American Library Association.

Downs, M. W. (1969). *Emergence of a Philosophy of Librarianship in the United States.* Unpublished master's report. Graduate Library School, Long Island University.

Dray, W.M. (1967) "Philosophy of History," *Encyclopedia of Philosophy*, v.6, Paul Edwrads, ed., New York: Macmillan.

Dretske, F. I. (1981). *Knowledge & the Flow of Information.* Cambridge, Mas.: The MIT Press. (First MIT Press paperback edition 1983).

Drucker, P. F. (1974). *Management; Tasks, Responsibilities, Practices.* New York: Harper & Row.

Durie [or Dury], J.] (1650). *The Reformed Librarie Keeper.* Chicago, 1906: Literature of Libraries in the Seventeenth and Eighteenth Centuries, II.

Ebert, F. A. (1820). "Die Bildung des Bibliothekars." In V. The Librarian's Series (English translation.), *The Training of the Librarian*, 1916, Woodstock.

Edwards, P. editor (1967). *The Encyclopedia of Philosophy*. New York: Macmillan Publishing Co.

Einstein, A. (1920). *Relativity, The Special and the General Theory; A Popular Exposition*. Translated by Robert W. Lawson, 15th ed. London, 1954.

Eisdorfer, L.F.C., and Blum Jarvik (eds) (1973) *Intellectual Functioning in Adults*: Psychological and Biological Influences. New York, Springer.

Emery, R. (July 1971). "Philosophy, Purpose and Function in Librarianship." *Library Association Record*, 73(7), 127-129. (The Library Association Price Essay,1971).

Engle, M. O. (1986). "Librarianship as Calling: The Philosophy of College Librarianship." *The Journal of Academic* Librar*ianship*, 12(1), 30-32.

Fackenheim, E. L. (1950). "Mediaeval Jewish Philosophy." *A History of Philosophical Systems*, 171-184.

Fairthorne, R. A. (1961). *Towards Information Retrieval*. London: Butterworths.

Fairthorne, R. A. (1965). "'Use' and 'Mention' in the Information Science." In Laurence Heilprin (ed.), *Proceedings of the Symposium on Education for Information Science*. Washington, D.C.: Spartan Books.

Fairthorne, R. A. (October 1968). "The Limits of Information Retrieval." *Journal of Library History and Comparative Librarianship*, 3, 364-369.

Fairthorne, R. A. (October 1968). "Repartee." *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(4), 363.

Fairthorne, R. A. (1969). "The Scope and Aims of the Information Sciences and Technologies." In A. I. Mikhailov (Chairman, FID/RI Committee.), *On theoretical Problems of Informatics*. FID 435 (pp. 25-30). Moscow: All-Union Institute for Scientific and Technical Information.

Fairthorne, R. A. (1973). "The Symmetries of Ignorance." In C. H. Rawski (Editor.), *Toward a Theory of Librarianship*. (pp. 262-267). Metuchen, N.J.: The Scarecrow Press.

Farradane, J. (September, 1976). "Toward Information Science." *Information Scientist*, 10, 91-101.

Farrington, B. (1944). *Greek Science*. Harmondsworth, England: Penguin Books.

Fayol, Henri (1929) *Industrial and General Administration*. Geneva: International Management Institute.

Fayol, H. (1949)._*General and Industrial Management*. New York: Pitman.

Feigl, H. A. Wilfrid Sellars (1949). *Readings in Philosophical Analysis*. New York: Appleton, Century, Crofts, Inc.

Ferm, V. (ed). (1950). *A History of Philosophical Systems*. New York: The Philosophical Library.

Ferm, V. (1950). "Early Christian Philosophy." In V. Ferm (ed.), *History of Philosophical Systems*. op.cit., pp.144-157.

Finks, L. W. (September, 1992). Ranganathan No Sexist. *American Libraries*, (Letters column) 23(8), 627.

Follett, M. P. (1941). *Dynamic Administration*; *The Collected Papers of Mary Parker Follett*. (Edited by Henry C. Metcalf and L. Urwick). New York: Harper's.

Ford, N. (January 1986). "Psychological Determinants of Information Needs: A Small-scale Study of Higher Education Students." *Journal of Librarianship*, 16(1), 47-62.

Foskett, D. J. (1962). *The Creed of a Librarian*: *No Politics*, *No Religion*, *No Morals*. London: Library Association. (Occasional paper no.3).

Foskett, D. J. (1964). *Science, Humanism and Libraries*. New York: Hafner Publishing Co.

Foskett, D. J. (1965). "Comparative Librarianship." In R.L. Collison (ed.), *Progress in Library Science*. (pp. 125-46). London: Butterworths.

Foskett, D. J. (1967). *Information Service in Libraries*. Hamden: Archon.2nd ed.

Foskett, D. J. (September, 1967). "Librarianship: Its Philosophy and History - Review." *Journal of Documentation*, 23, 352.

Foskett, D. J. (December 1968). "The Intellectual and Social Change of the Library Service." *Library Association Record*, 70, 305-309.

Foskett, D. J. (December 1970). "Progress in Documentation: 'Informatics'." *Journal of Documentation*, 26(4), 340-369.

Foskett, D.J. (July, 1972) "Information and General System Theory. Review. *Journal of Librarianship*, 4(1) 205-209.

Foskett, D. J. (1973). "The Contribution of Classification to a Theory of Librarianship." In C. H. Rawski (Editor.), *Toward a Theory of Librarianship*. (pp. 169-186). Metuchen, N.J.: The Scarecrow Press.

Foskett, D. J. (1974). "General Systems Theory and the Organization of Libraries." In G. Holroyd (editor.), *Studies in Library Management*. 2 (pp. 11-24). London: Clive Bingley.

Foskett, D. J. (April 1974-a). "Information and Systems Philosophy - Review." *Journal of Librarianship*, 6(2), 126-130.

Foskett, D. J. (1984). *Pathways for Communication*; *Books and Libraries in the Information Age*. London: Clive Bingley.

Foskett, D. J. (April 1985). "A Note on Libraries and the 'Paperless society.'" *International Forum on Information and Documentation*, 10(2), 47. (Letters Column).

Foskett, D. (October 1986). "Theme Speaker; Information and Imagination." *Canadian Library Journal*, 43(5), 311-316.

Foss, S. W. (March, 1909). "Some Cardinal Principles of a Librarian's Work." *Public Libraries*, 14, 77-81. (Also reprinted in B.McCrimmon: American Library Philosophy 1975, op.cit., pp.31-38).

Foster, M. (1979). "Philosophy of Librarianship." *Canadian Library Journal*, 36(3), 131-7.

Fox, C. J. (1983). *Information and Misinformation*; *An Investigation of the Notions of Information, Misinformation, Informing and Misinforming*. Westport, Conn.: Greenwood Press.

Frege, G. (1879). "Begriffsschrift eine der Arithmetischen nachgebildete Formelsprache des reinen Denkens, Halle." In Peter Geach and Max Black (eds.), *Translations from the Philosophical Writings of Gottlob Frege*. 1952 Oxford: Oxford University Press.

Frege, G. (1884). "Die Grundlagen der Arithmetik eine Logisch-mathematische Untersuchung uber den Begriff der Zahl.Breslau." In J.L. Austin (translator.), *The Foundations of Arithmetic, a Logico--mathematical Enquiry Into the Concept of Number*. 2d. rev. edition, 1953. Oxford and New York.

Fremantle, Ann (ed) (1954) *The Age of Belief*; The Medieval Philosophers. New York, Mentor Books.

Garceau, O. (1949). *The Public Library in the Political Process_*. New York: Columbia University Press.

Gardner, F. M. (August 1964). "Presidential Address." *Library Association Record*, 66, 332-337.

Garvey, W. D. (1979). *Communication: The Essence of Science. Facilitating Information Exchange Among Librarians, Scientists, Engineers and Students*. Oxford, New York: Pergamon Press.

Gates, J. (1976). *Introduction to Librarianship*. New York: McGraw-Hill.

Gates, J. K. (1990). *Introduction to Librarianship*. New York: Neal-Schuman Publishers. (3rd ed.)

Godel, K. (1931). "On Formally Undecidable Propositions of Principia Mathematica and Related Systems." [Quoted after E. Nagel and J.R. Newman (1958), op.cit.]

Godel, K. (1944). Russell's Mathematical Logic. In Paul A. Schlipp, *The Philosophy of Bertrand Russell*. Evanston and Chicago.

Goldhor, H. (April, 1942). "A Note on the Theory of Book Selection." *Library Quarterly*, 12, 151-174. (Also reprinted in B.McCrimmon: American Library Philosophy, 1975, op.cit., pp.106-131).

Gore, D. (November 1970). "Against the Dogmatists: A Sceptical View of Libraries." *American Libraries*, 953-957.

Granick, S. and A.S. Friedman. (1973). "Educational Experience and the Maintenance of Intellectual Functioning by the Aged; An overview." In L. F.,C. Eisdorfer and J.E. Blum Jarvik (eds.), *Intellectual Functioning in Adults: Psychological and Biological Influences*. (pp. 59-64). New York: Springer.

Graziano, E. E. (1955). *The Philosophy of Hegel as Basis for the Dewey Decimal Classification Schedule*. Unpublished Master of Art Thesis. The University of Oklahoma, Norman, Oklahoma.

Graziano, E. E. (1975). *Language-Operational-Gestalt Awareness.* (A radically empirical and pragmatical phenomenology of the processes and systems of library experience). Tempe, Arizona: The Association for Library Automation Research Communication.

Green, R. (June 1991). "The Profession's Models of Information: A Cognitive Linguistic Analysis." *Journal of Documentation*, 47(2), 130-148.

Haines, H. E. (September 1,1938). "Technics or Humanization in Librarianship?" *The Library Journal*, 63, 619-623.

Haines, H. E. (1950) "The World of Books. Living with Books: The Art of Book Selection." 2nd ed. (New York, Columbia University Press, 1950),pp. [3]-11.) Reprinted in B. McCrimmon (Editor.), *American Library Philosophy*,1975, op.cit., (pp. 141-149).

Hall, A. D., and R.E. Fagen. (1956). "Definition of a System." *General Systems Yearbook of Society for the Advancement of General Systems Theory*, 1, 18-28.

Hampshire, S. (1956). *Th Age of Reason.* New York: New American Library.

Harley, J. (July 1953). "Selection and Compression." *The Library World*, 55, 3-4.

Harlow, Neal (1969) "Field Theory and the Curriculum, a Unified Approach." *Journal of Education for Librarianship*, 10 (Fall, 1969) pp.78-85. Also reprinted in McCrimmon, American Library Philosophy, op.cit.

Harmon, G. (1973). *Human Memory and Knowledge*; *A System Approach.* Westport,Conn.: Greenwood Press. (Contribution in Librarianshiop and Information Science Number 6).

Harris, M. H. (1976). "Portrait in Paradox: Commitment and Ambivalence in American Librarianship, 1876-1976." *Libri*, 26(4), 281-301.

Harris, M.H. (1978) *Review of A History of the Principles of Librarianship.* Journal of Library History, 13(3) 367-369).

Harris, M.H. (1986) *State, Class, and Cultural Reproduction: Toward a Theory of Library Service in the United States.* In: Advances in Librarianship, 14 (211-251) Academic Press.

Harrod, L. M.(1977) *The Librarians' Glossary of Terms Used in Librarianship, Documentation and the Book Crafts and Reference Book*. 4th ed.rev.

Harvey, J.F., and P. Spyers-Duran (1984) (eds.) *Austerity in Management in Academic Libraries*. Metuchen, N.J., The Scarecrow Press.

Harwell, R. (May 1960). "The Magic Triad." *Wilson Library Journal*, 34, 655-656, 662-663.

Haskell, R.E. (1987) (ed) *Cognition and Symbolic Structures*; The Psychology of Metaphoric Transformation. Norwood, N.J., Ablex Publishing Co.

Haugh, W. S. (December 1953). "What Should We Provide?" *The Librian and Book World*, 62(12), 229-237.

Hayes, R. M. (1969). "Information Science in Librarianship." *Libri*, 19(3), 216-236.

Hayes, R. M. (1987). *Syllabus for Methods of Research Component*. (mimeograph).

Hayes, R. M. (1989). "Librarians in Search of Science and Identity- Review." *Library Quaretrly*, pp. 69-71.

Heiliger, E. M., and Henderson, Paul B. (1971). *Library Automation: Experience, Methodology, and Technology of the Library as an Information System*. New York: McGraw-Hill Book.

Heilprin, Laurence, ed. (1965) *Proceedings of the Symposium on Education for Information Science*. Washington,D.C.: Spartan Books.

Henderson, M.E.P. (1978) "Review of Thompson, J. A History of the Principles of Librarianship, 1977." In: *Canadian Library Journal*, 35:3, June 1978, pp.231-232.

Henry, N. B. (Editor). (1943). "The Library in General Education." In National Society for the Study of Education, *The Fourthy-Second Yearbook*. Chicago: The University of Chicago Press.

Hesse, M. (1967). "Models and Analogy in Science." In *The Encyclopedia of Philosophy*. op.cit., 5 (pp. 354-359). New York: Macmillan Publishing Co.

Hessel, A. (1955). *A History of Libraries*. New Brunswick, N.J.: The Scarecrow Press. (Translated, with supplementary material by Reuben Peiss; Reuben Peiss Memorial edition).

Hewins, E. T. (1990). "Information Need and Use Studies." *Annual Review of Information Science and Technology* (ARIST), 2, p.164.

Hilbert, D. (1899). "Die Grundlagen der Geometrie." In E. J. Townsend (translator.), *Foundations of Geometry.* La Saile, Ill, 1902.

Hollnagel, E. (1978). "The Paradigm for Understanding in Hermeneutics and Cognition." *Phenomenological Psychology*, 9(1), 188-217.

Holroyd, G.,ed. (1974) *Studies in Library Management.* London: Clive Bingley.

Horowitz, R. G. de (1988). *Librarianship; A Third World Perspectives.* New York: Greenwood Press.

Houle, C. O. (November 1-15,1946). "A Basic Philosophy of Library Service for Adult Education." *Library Journal*, 72, 1513-1517, 1600-1604. (Published in two consecutive issues).

Howard, R. J. (1982). *Three Faces of Hermeneutics; An Introduction to Current Theories of Understanding.* Berkeley: University of California Press.

Iben, I. (October 1962). "Library Deontology." *The Library Quarterly*, 32(4), 304-308.

Irwin, R. (1949). *Librarianship; Essays on Applied Bibliography.* London: Grafton.

Irwin, R. (1961). "Librarianship." In T. Landau (Editor.), *Encyclopaedia of Librarianship* (2nd). London: Bowes and Bowes.

Irwin, R. (1967) "Librarianship." In: *Encyclopaedia of Librarianship*, ed. by T. Lanadau. New York, Hafner, pp.248-51.

Isaacson, D. (February 1,1982). "Anti-Intellectualism in American Libraries." *Library Journal*, 107(3), 227-232.

Jackson, M. M. (1984). "Convergence: The New Information Sciences. *Education for Information*, 2, 309-311.

Joeckel, C. B. (February 1,1932). "Supply and Demand in the Library Profession." *The Library Journal*, 57, 103-110.

Joeckel C.B and Amy Winslow (1948). *A National Plan for Public Library Service.* Chicago: ALA.

Johnson, A. (1938). *The Public Library-A People's University*. New York: American Association for Adult Education.

Johnson, W. E. (I,1921; III,1924). *Logic*. v.1 and v.3. Cambridge.

Jurji, E. J. (1950). "Arabic and Islamic Philosophy." *A History of Philosophical Systems*, op.cit.,pp.158-170.

Kao, Chin-hsüeh (1985). *T'u shu kuan ch'e hs'ueh chih yen chiu* (A Study of Library Philosophy). Taipei, Taiwan: Shu P'eny Ch'u Pan Sh'e.

Kao, C.-k. (1989). *Chiao se ting wei yu t'u shu kuan chik fa chan* (Roles of the Library and Its Development). Taipei: Shu p'eng pan She.

Kaplan, A. (October 1964). "The Age of the Symbol - A Philosophy of Library Education." *Library Quarterly*, 34(4), 295-304.

Kaplan, A. (1964-a) *The Conduct of Inquiry*. San Francisco: Chandler.

Karetzky, S. (1982). *Reading Research and Librarianship; A History and Analysis*. Westport,Conn.: Greenwood press. (Contributions in Librarianship and Information Science, Number 36).

Karstedt, P. (1954). *Studien zur Sociologie der Bibliothek*. Wiesbaden: Otto Harrasowitz.

Kaser, D. (July 1971). "The Ptolemaic Theory of Librarianship." *Oklahoma Librarian*, 10-13.

Kaske, N. K. and James E. Rush (1980). *Library and Information Science Research*. Chicago: American Library Association.

Kemp, D. A. (1976). *The Nature of Knowledge; An Introduction for Librarians*. London: Clive Bingley. (Foreword by D.J. Foskett)

Kennick, W. E. (1967). "Appearance and Reality." *The Encyclopedia of Philosophy*, op.cit., 1, 135-138.

Kent, A. (1968). "Solving the 'Unsolvable' Problems in Information Transfer." In *ASIS 5th Mid-year Meeting*. Nashville, Tennessee.

Kent, A. (1974). "Unsolvable Problems in Information Science." In Anthony Debons (ed.), *Information Science: Serach for Identity*. (pp. 299-312). New York: Dekker.

Kent, Allen (1976) "Solving the 'Usolvable' Problems in Information Transfer." Paper presented at the *ASIS* 5th Mid-year Meeting. Nashville, Tennessee, May 20, 1976.

Kerferd, G. B. (1967). Aristotle. *The Encyclopedia of Philosophy*, op.cit., 1, 151-162.

Khurshid, A. (January 1976). "Intellectual Foundations of Library Education." *International Library Review*, 8, 3-21.

Kim, Jaegwon (1967) "Explanation in Science." In: *The Encyclopedia of Philosophy*, op.cit., v.3,pp.159-163.

King, D. W. (February 1983). "Professor Fritz Machlup, 1903-1983." *Bulletin of the American Society for Information Science*, 9(3), 28-29.

Klir, George J. (1969) *An Approach to General Systems Theory*. Van Nostrand Reinhold Co.

Kochen, M. (July 1969). "Stability in the Growth of Knowledge." *American Documentation*, 20(3), 186-197.

Kochen, M. (1983). "Library Science and Information Science." In F.Machlup and U.Mansfield Machlup (editors), *The Study of Information*, op.cit., pp. 371-377.

Kolitsch, M. (January 1945). "Toward a Philosophy of Librarianship. *Library Quarterly*, 15, 25-31.

Krieg, C. J. (1970). *Herbert Putnam's Philosophy of Librarianship as Reflected in Selected Writings*. Unpublished doctoral dissertation, Long Island University, Brookville, N.Y.

Krupskaia, N. K. (1968). "We Shall Fulfil Lenin's Instructions on Library Work." In Lenin, *Krupskaia and Libraries*. (pp. 47-48). Hamden, Conn.: Archon Books.

Ladner, Sharyn J. (1992). "Resourse Sharing by Sci-tech and Business Libraries: Informal Networking and the Role of Professional Associations." In: *Library and Information Science Research Electronic Journal*. E-mail from Editors@Kentvm, December 15, 1992, 1428 lines.

Lakoff, G. and Mark Johnson (1980). *Metaphors We Live By*. Chicago: The University of Chicago Press.

Lakoff, G. (1997). *Women, Fire, and Dangerous Things; What Categories Reveal about the Mind*. Chicago: The University of Chicago Press.

Lancaster, F. W., (1977). *The Measurement and Evaluation of Library Services*. Arlington, Virginia: Information Resources Press. (With the assistance of M.J. Joncich).

Lancaster, F. W. (1978). *Toward Paperless Information Systems*. New York: Academic Press.

Lancaster,F.W. (June 30,1980). "Librarians in 2001." *Library Journal/School Library Journal*, 9(26), 2-3.

Lancaster, F. W. (1982). "The Evolving Paperless Society and Its Implications for Libraries." *International Forum on Information & Documentation*, 7(4), 3-10.

Lancaster, F.W. (1992) "Review of M. Buckland's Information and Information Science, 1991." *Journal of Education for Library and Information Science*, 33(3), Summer, 1992, pp.265-267.

Landheer, B. (1957). *Social Functions of Libraries*. New York: The Scarecrow Press.

Lane, R. M. (July-August 1935). "A Philosophy for the Special Librarian." *Special Libraries*, 26(6), 151-154.

Langlois, R. N. (1983). "Systems Theory, Konwledge, and Social Sciences." In F. Machlup, & Mansfield Una (Editors), *The Study of Information; Interdisciplinary Messages*, op.cit.

Laski, h. J. (December 1, 1935). "Uses of the Public Library." *Library Journal*, LX, 909-912.

Laszlo. Ervin. (1975). "The Meaning and Significance of General System Theory." *Behavioral Science*, 20, 9-24.

Lee, J. M. (May 1985). *Three-Dimensional Data Representations and Their Utility for Managerial Decision-Making*. Unpublished doctoral dissertation, Rensselaer Polytechnic Institute, Troy, N.Y.

Lekai, E. A. (1977). "Librarian as a Generalist: An Essay on the Philosophy of Librarianship." *Lacuny Journal*, 5(1), 1-5.

Levitan, K. B. (1982). "Applying a Holistic Framework to Synthesize Information Science Research." In B. Dervin and M. J. Voight (eds.), *Progess in Communication Sciences*, 2. (pp. 241-273). Norwood, N.J.: Ablex Publishing Co.

Lewis, C. I. (1981). "Philosophy." In *The Encyclopedia Americana*. (pp. 769-77). Danbury, Conn.: Grolier.

Licklider, J. C. R. (1965). *Libraries of the Future.* Cambridge, Mass.: M.I.T.

Lindsay, J. (March 1977). "Preparing for Change." *Assistant Librarian*, 70(3), 46-9.

Line, M. B. (1968). "The Functions of the University Library." In W. L. Saunders (ed.), *University and Research Library.* (pp. 148-158). Oxford. England: Pergamon Press.

Line, M. B. (1975) "Demystification in Librarianship and Information Science)." In Line Maurice Barr (eds.), *Essays on Information and Libraries. Festschrift for Donal Urquhart.* (pp. 107-116). London and Hamden,Conn.: Clive Bingley (London) and Linnet Books (Hamden).

Lingam, P. P. (1984). "Decision-making Process and the Information Needs of and by Managers in Business and Industry." In A. Van Der Lan and A. A. Winters (eds.) *The Use of Information in a Changing World.* (pp. 41-55) Amsterdam, North-Holland.

Locke, D. (1967). *Perception and Our Knowledge of the External World.* New York: George Allen and Unwin.

Lofgren, H. (November,1985). "Post-Industrialism and Librarianship: A Critique." *The Australian Library Journal*, 34(4), 25-30.

Long, L. and L. Welch. (1971). "Influence of Levels of Abstractness on Reasoning Ability." In P. S. Sears (ed.), *Intellectual Development.* (pp. 155-171). New York: Wiley.

Lyle, Guy R. (1978) Review of History of the Principles of Librarianship, 1977, by J. Thompson. In: *Library Journal*, September 1, 1978, 103:15,pp.1575-6.

Machlup, F. (1980). *Knowledge: Its Creation, Distribution, and Economic Significance.* Princeton,N.J.: Princeton University Press. (vol.1. Knowledge and Knowledge Production).

Machlup, F., and U. Mansfield (1983). "Cultural Diversity in Studies of Information." In F. Machlup, & U. Mansfield (Editors), *The Study of Information; Interdisciplinary Messages.* (pp. 3-59). New York: John Wiley.

MacLeish, A. (June,1940). "Of the Librarian's Profession." *Atlantic Monthly*, 165, 786-90.

MacLeish, A. (1940-a). The Librarian and the Democratic Process." *ALA Bulletin*, 34, 385-388,421-422.

MacLeish, A. (Summer,1972). "The Premise of Meaning." *American Scholar*, 41, 357-362. (Also reprinted in B.McCrimmon, American Library Philosophy, 1975, op.cit., pp.229-235).

MacPherson, H. D. (January, 1939). "Some Thoughts on the Philosophy of Cataloging." *Library Quarterly*, ix, 63-71.

Madden, P. J. (April 1951). "No Music in Particular." *Irish Library Bulletin*, 12, 49-50.

Madden P.J. (May 1951). "Towards a Definition; A Raid on the Inarticulate." *Irish Library Bulletin*, 12, 86-88.

Madden, P. J. (June 1951). "Scanted in a Dull Cage." *Irish Library Bulletin*, 12, 104-106.

Madden, P. J. (July-August, 1951). "Conscripts of Good Intentions. *Irish Library Bulletin*, 12, 128-130.

Malcles, L. N. (1961). *Bibliography.* New York: The Scarecrow Press. (Translated by Theodore Christian Hines)

Mansfield, U. (1987). "The Wider Scope of Information Research." In B. Katz, & Robin Kinder (Editors.), *Current Trends in Information Research*, Hwhorth Press.

Marco, G. A. "Old Wine in New Bottles. *Library Association* Bul*letin*, 8-14. (Also reprinted in B. McCrimmon, American Library Philosophy, 1975, op.cit., pp.190-201.

Martin, L. (October,1937). "The American Public Library as a Social Institution." *Library Quarterly*, 546-563. (Reprinted in B.McCrimmon, American Library Philosophy, 1975, op.cit., pp.88-105).

Mason, E. (May 15,1971). "The Academic Way." *Library Journal*, 1671-1676.

Mason, E. (May 1971a). "The Great Gas Bubble Prick't; or, Computers Revealed by a Gentleman of Quality." *College & Research Libraries*, 183-196.

Mason, R. M. (April 15,1985). "Artificial Intelligence: Promise, Myth, and Reality." *Library Journal*, 110(7), 56-57.

Matheson, N. (Summer 1984). "The Academic Library Nexus." Yuri Nakata Lecture, 1983. *EDUCOM Bulletin*, 12-17, 34.

McCauley, R. (1987) "The Role of Theories in a Theory of Concepts." In: U. Neisser, *Concepts and Conceptual Development*, 1987, op.cit.,pp.228-309.

McChesney, K. (1984). "History of Libraries, Librarianship, and Library Education." In A. R. Rogers, & McChesney K., *The Library in Society*, op.cit.,pp. 33-60.

McClellan, A. W. (July 1962). "What Are We Up To?" *The Library Association Record*, 64, 235-239.

McColvin, L. R. (1956). *The Chance to Read*; *Public Libraries in the World Today*. London: Phoenix House.

McConnell, J. C. (1992). "De Metaphysica Artis Bibliotecarii." *Libri*, 42(1), 53-62.

McCorison, M. A. (Second Quarter 1984). "Bibliography and Libraries at the Brink: A Jeremiad." *The Papers of the Bibliographical Society of America*, 78(2), 127-36.

McCrimmon, B. (Editor). (1975). *American Library Philosophy*; *An Anthology*. Hamden, Conn.: The Shoe String Press.

McCrimmon, B. (1989). Richard Garnett; *The Scholar as Librarian*. Chicago: American Library Association.

McCrimmon, B. (1993). "Librarianship, Philosophies of." In W. Wiegand (ed.), *Encyclopedia of Library History*. (Scheduled for publication by Garland Publishing Co.)

McCrum, B. P. (September 1946). "The Idols of Librarianship." *Wilson Library Bulletin*, 21(1), 41-47.

McGarry, K. J. (1975). *Communication Knowledge and the Librarian*. London: Clive Bingley.

McGarry, K. J. (1981). *The Changing Context of Information*; *An Introductory Analysis*. London: Clive Bingley.

McInnis, R. (1982). "Do Metaphors Make Good Sense in Teaching Research Strategy?" In C. Oberman, & Strauch Katina (Editors.), *Theories of Bibliographic Education*. (pp. 47-74). New York: R.R.Bowker.

McMahon, A. M., and J. Tydeman (1977). "A System Framework for Library Analysis." In G. J. Klir (Editor.), *Applied General Systems Research*: *Recent Developments and Trends*. (pp. 905-916). New York: Plenum Press.

McMullen, H. (October 1957). "Research in Backgrounds in Librarianship." *Library Trends*, 6(2), 110-119.

McNeil, William H. (1953) *History Handbook of Western Civilization*. Chicago: The University of Chicago Press.

Mei, Y.P.(1967) "Mo Tzu." In: *The Encyclopedia of Philosophy*, 1967, op.cit., v.5, pp.409-410.

Menzel, J. P. (1972). *Arthur Owen Barfield: An Appraisal of His Contribution to Epistemological Studies.* Unpublished doctoral dissertation, Long Island University.

Merikangas, R. J. (1987). "Theory and Practice of Library Client Interaction." *The Reference Librarian*, 297-312.

Metcalf, K. D., et al. (1943). *The Program of Instruction in Library Schools.* Urbana: University of Illinois Press.

Meyer, H. B. H. (February 15,1925). "Librarianship - A Definition." *The Library Journal*, 50, 177-178.

Mikhailov, A. I., A. I. Chernyi, and R. S. Gilyarevskii (1969). "Informatics: Its Scope and Methods." In A. I. Mikhailov (editor.), *On Theoretical Problems of Informatics.* (pp. 7-23). Moscow: All-Union Institute for Scientific and Technical Information.

Miller, George A., Eugene Galanter, and Karl H. Pribram. (1960) *Plans and Structure of Behavior.* New York, Holt.

Miller, R. A. (April 15,1936). "Search for Fundamentals." *The Library Journal*, 61, 298.

Mohrhardt, F. E. (May 1964). "Documentation: A Synthetic Science." *Wilson Library Bulletin*, 38(9), 743-749.

Montgomery, E. B. (1968). *The Foundations of Access to Knowledge; A Symposium.* Syracuse, N.Y.: School of Library Science, Syracuse University. (Frontiers of Librarianship Number 8).

Mooers, C. N. (June 1974). "Analysis of the Hexagon of Notification." *Journal of Documentation*, 30, 2.

Mortazavian, H. (1983). "On System Theory and Its Relevance to Problems in Information Science." In F. Machlup, & U. Mansfield (Eds), *The Study of Information; Interdisciplinary Messages.* op.cit., pp. 517-545.

Mortazavian, H. (1983-a). "System Theory Versus System Philosophy." In F. Machlup, & U. Mansfield (Editors.), *The Study of Information; Interdisciplinary Messages*, op.cit., pp. 573-577.

Mukherjee, A. K. (1966). *Librarianship; Its Philosophy and History.* New York: Asia Publishing House.

Mumford , L. Q. (February 15,1966). "Librarians and the Everlasting Now." *Library Journal*, 901-906.

Munn. R. (1936). *Conditions and Trends in Education for Librarianship.* New York: Carnegie Corporation.

Nader, R. (November 1974). "A Philosophy of What Libraries Should Mean to the Community: Keynote address 1974 PLA Conference." *PLA Bulletin*, 243-249.

Naess, A. (1968). *Scepticism.* London: International Library of Philosophy and Scientific Method.

Nagel, E. and James R. Newman (1958). *Godel's Proof.* New York: New York University Press.

Nagel, T. (1986). *The View from Nowhere.* New York: Oxford University Press.

National Commission on Libraries and Information Service. (February 15,1974). "A New National Program of Library and Information Service." *Library Journal*, 449-457.

Naudé, G. (1627). "Avis Pour Dresser une Bibliotheque." J. Evelyn (Translator.), *Instructions Concerning Erecting of a Library.* London: 1661. Reprinted, 1903.

Neill, S. D. (Spring 1985). "The Reference Process and the Philosophy of Karl Popper". *RQ*, 24(3), 309-319.

Neill, S. D. (September 1987). "The Dilemma of the Subjective in Information Organisation and Retrieval." *Journal of Documentation*, 43(3), 193-211.

Neisser, Ulrich (1987), (ed.) *Concepts and Conceptual Development: Ecological and Intellectual Factors in Categorization.* Cambridge and New York, Cambridge University Press.

Newman, William H., and Harvey W. Wallender III (1978) "Managing Not-for-Profit Enterprises." *Academy of Management Review*, 3:24-31, Jan.1978.

Nitecki, Danuta A., (1993) *Conceptual Models.* (To be published in *Journal of Documentation*).

Nitecki, J. Z. (July, 1964). "Public Interest and the Theory of Librarianship." *College & Research Libraries*, 25(4), 269-278,325.

Nitecki, J. Z. (April, 1968). "Reflection on the Nature and Limits of Library Science." *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(2), 103-119.

Nitecki, J. Z. (October, 1968-a). "Reply of Mr. Nitecki to Mr. Fairthorne." *The Journal of Library History, Philosophy and Comparative Librarianship*, 3(4), 369-374.

Nitecki, J. Z. (September 1968-b). "The Title Catalog: A Third Dimension." *College & Research Libraries*, 29(5), 431-436.

Nitecki, J. Z. (Winter 1969). "Simplified Classification and Cataloging of Microforms." *Library Resources & Technical Services*, 13(1), 79-85.

Nitecki, J. Z. (April 1,1969). "Speed Cataloging: Prudence and Pitfalls." *Library Journal*, 94(7), 1417-1421.

Nitecki, J. Z., and J. Dulka, (Fall 1970). "Filing Rules for a Three-Dimensional Catalog." *Library Resources & Technical Services*, 14(4), 485-496.

Nitecki, J. Z. (June 1970). "Toward a Conceptual Pattern in Librarianship: A Model." *General Systems Bulletin*, 2(11), 2-16. (Also in: ERIC ED126897).

Nitecki, J. Z. (Winter 1979). "Metaphors of Librarianship: A Suggestion for a Metaphysical Model." *The Journal of Library History, Philosophy and Comparative Librarianship*, 14(1), 21-42.

Nitecki, J. Z. (1979-a) *On the Modality of Discourse in the Theory of Librarianship*. ERIC. (ED 171267).

Nitecki, J. Z. (Summer 1980). "Conceptual Dimension of Library Management." *Journal of Library Administration*, 1(2), 47-58.

Nitecki, J. Z. (Winter 1981). "An Idea of Librarianship: An Outline for a Root-Metaphor Theory in Library Science." *Journal of Library History, Philosophy and Comparative Librarianship*, 16(1), 106-120.

Nitecki, J. Z. (Fall 1983). "Old Ghost in a New Body: Some Misconceptions about Information-Knowledge Relations and the Role of Computers in Academic Libraries." *Research Strategies*, 1(4), 148-154.

Nitecki, J. Z. (May/June 1983). "The Predicament of Hypocrisy in Librarianship." *Catholic Library World*, 54(10), 406-411.

Nitecki, J. Z. (1984). "Creative Management in Austerity. In J. F. Harvey, and P. Spyers-Duran (Editors.), *Austerity Managemen in Academic Libraries*. (pp. 43-61). Metuchen, N.J.: The Scarecrow Press.

Nitecki, J. Z. (Summer 1984-a). "Decision-Making and Library Staff Morale: Three Dimensions of a Two-Sided Issue." *Journal of Library Administration*, 15(4), 59-78.

Nitecki, J. Z. (Fall 1985). "The Concept of Information-Knowledge Continuum: Implications for Librarianship." *The Journal of Library History, Philosophy and Comparative Librarianship*, 20(4), 387-407.

Nitecki, J. Z. (August 1986). "Creative Reading; Of Letter Thoughts and Words." *Canadian Library Journal*, 43(4), 229-233.

Nitecki, J. Z. (Spring/Fall 1987). "Cognitive Processes and Librarianship: Review of Literature in Search of a Model." *Current Studies in Librarianship*, 11(1/2), 1-12.

Nitecki, J. Z. (1987-a). "In Search of Sense in Common Sense Management." *Journal of Business Ethics*, 6, 639-647.

Nitecki, J. Z. (Spring/Fall 1988). "On the Significance of an Intellectual Environment in Librarianship." *Current Studies in Librarianship*, 12(1/2), 35-46.

Nitecki, J. Z. (January 1989). "The Nature of Information. By P.Young--Review." *Library Resources & Technical Services*, 33(1), 90-91.

Nitecki, J. Z. (January 1989). *Survey of Common Bibliographic Denomionators Among Disciplines Participating in the SUNY-Albany Ph.D. Program in Information Science.* ((revised) (Microfiche ERIC 316 072).

Nitecki, J. Z. (1991). *Selected Thematic Priorities in American Graduate Introductory Courses to Library and Information Science.* (Microfiche: ED331527).

Norris, D. M. (1939). *A History of Cataloging and Cataloging Methods*, 1100-1850. London: Grafton.

Oberman, C., and K. Strauch, eds. (1982) *Theories of Bibliographic Education.* New York: R.R. Bowker.

Oboler, Eli. (1976). "The Free Mind: Intellectual Freedom's Perils and Prospects." *Library Journal*, January 1, 1976, 101(1): 237-242.

Oboler, E. M. (Spring 1979). "The Purpose of a Librarian." *Utah Libraries*, 22(1), 21-24.

Oboler, E. M. (1983). *To Free the Mind: Libraries, Technology and Intellectual Freedom*: Libraries Unlimited.

Ogilvie, R. A. (May 1940). "Keeper of the Keys." *Wilson Library Bulletin*, 14, 640-641,645.

Orman, O. C. (December 1935). "The Philosophy of Librarianship." *Bulletin of the American Library Association*, 29(12), 820-827.

Orman, O. C. (February 1940). "How Does This Sound?" *Wilson Library Bulletin*, 14, 450,466.

Orr, J. M. (November 1,1977). "Libraries as Communication Systems - Review." *Information Hotline*, 9(10), 27.

Ortega y Gasset, J. (January 1936). "Man Must Tame the Book." *Wilson Bulletin for Librarians*, 10(5), 305-307.

Ortega y Gasset, J. (Summer 1961). "The Mission of the Librarian." *Antioch Review*, 21(2), 133-154.

Ortony, A. (1979). *Metaphor and Thought*. Cambridge: Cambridge University Press.

Otten, K. and Debons, Anthony. (January-February 1970). "Towards a Metascience of Information: Informatology." *Journal of American Society for Information Science*, 21(1), 89-94.

Otten, K. W. (1974). "Basis for a Science of Information." In A. Debons (Editor.), *Information Science; Search for Identity*. (pp. 91-106). Marcel Dekker.

Parker, M. M., and Robert J. Benson. (December 1, 1987). "Information Economics: An Introduction." *Datamation*, 33(23), 86,90,94,96.

Parsons, C. (1967). "Mathematics, Foundations Of." In *The Encyclopedia of Philosophy*, op.cit., (pp. 188-213.

Passmore, J. (1967). "Philosophy." In *The Encyclopedia of Philosophy*, op.cit., 6 ,pp. 216-226.

Peirce, P. (June 15,1951). *A Study of the Philosophy of Librarianship; A Review of the Relevant Literature, 1930-1950*. Unpublished master's study, The DrexelInstitute of Technology, School of Library Science, Philadelphia.

Pepper, S. C. (1957). *World Hypotheses; A Study in Evidence*. Berkeley: University of California Press.

Pepper, S. C. (1966). *Concept and Quality; A World Hypothesis.* La Salle, Ill.: Open Court.

Person, Ruth J., ed., *The Management Process; A Selection of Readings for Librarians.* Chicago, American Library Association, 1983.

Pickup, J. A. (October 1987). "What Business Are We Really In?" *ASLIB Proceedings*, 39(10), 281-291.

Pierce, S. J. (September 1992). "Dead Germans and the Theory of Librarianship." *American Libraries*, 23(8), 641-643.

Popper, K. (1963). *Conjectures and Refutations: The Growth of Scientific Knowledge*: Harper.

Popper, K. R. (1972). *Objective Knowledge; An Evolutionary Approach.* Oxford: Oxford University Press.

Popper, K. R. (1979 (rev.ed.). *Objective Knowledge.* Oxford: Clarendon Press.

Powell, L. C. (1954). "A Bookman's Credo." In B. McCrimmon *American Library Philosophy; An Anthology*, 1975, op.cit., pp.161-164 [Reprinted from the Alchemy of Books and Other Essays and Addresses on Books and Writers. Los Angeles:The Ward Ritchie Press, 1954, pp.91-96.]

Powell, L. C. (September 1959). "The Elements of a Good Librarian. *Wilson Library Bulletin*, 34, 412-416.

Power, E. (1976). "O-P Books: A Library Breaktrough." In A. B. Veaner (Editor.), *Studies in Micropublishing, 1853-1976.* (pp. 331-335). Wesport, Conn.: Microform Review Inc.

Pratt, A. D. (1982). *The Information of the Image.* Norwood, N.J.: Ablex Publishing Corporation. (Libraries and Librarianship; An International Series edited by M.J.Voight).

Predeek, A. (October 1939). "The Idea of the American Library." *Library Quarterly*, 9, 445-476.

Putnam, G. H. (1896-1897). *Books and Their Makers in the Middle Ages.* New York.

Putnam, H. (July, 1915). "Per Contra". *Library Journal*, 40, 471-476. (Also reprinted in B. McCrimmon, American Library Philosophy, 1975, op.cit. pp.39-50.

Quint, B. (April, 1992). "The Last Librarian: End of a Millenium." *The Canadian Journal of Information Science/Revue Canadienne des Sciences de l'information*, 17(1), 32-40.

Rahman, F. (1967). "Islamic Philosophy." In *The Encyclopedia of Philosophy*, op.cit., 4, pp.219-224.

Ranganathan, S. R. (1931). *The Five Laws of Library Science.* Bombay: Asia Publishing House.

Ranganathan, S. R. (1948). *Preface to Library Science.* Delhi: University of Delhi.

Ranganathan, S. R. (September 1948). "Philosophy of Public Librarianship." *Indian Librarian*, 3(2), 49-59.

Ranganathan, S. R. (1951). *Philosophy of Library Classification*_. Copenhagen: Ejnar Munksgaard.

Ranganathan, S.R. (1957) *Five Laws of Library Science.* New York:Asia.

Ranganathan, S. R. (1963). *Five Laws of Library Science.* Bombay: Asia Publishing House.

Ranganathan, S. R. (1967). *Prolegomena to Library Classification.* New York: Asia House.

Ranganathan, S. R. (1973). "What and How of Documentation Trainining." In Conrad H. Rawski (ed.(, *Toward a Theory of Librarianship*, op.cit., pp. 495-514.

Rao, K. R. Krishna. (September 1961). "Philosophy of Librarianship." *Indian Librarian*, 16(2), 69-72.

Rawski, C. H. (1973). "The Interdisciplinarity of Librarianship." In C. H. Rawski (ed.), *Toward a Theory of Librarianship.* op.cit., pp. 116-146.

Rayward, W. B. (1983). "Library and Information Science; Disciplinary Differentatiation, Competition, and Convergence." In F. Machlup, & U. Mansfield (Editors.), *The Study of Information*; *Interdisciplinary Messages*, op.cit., pp. 343-363).

Reddy, K. S. (September 1970). "The Need for Philosophy of Librarianship." *Indian Librarian*, 81-84.

Reddy, M. J. (1979). "The Conduit Metaphor - A Case of Frame Conflict." In Andrew Ortony (ed.), *Metaphor and Thought.* (pp. 284-324). Cambridge: Cambridge University Press.

Reece, E. J. (1936). *Curriculum in Library Schools*. New York: Columbia University Press.

Reeves, J. W. (1965). *Thinking About Thinking*. New York: George Braziller.

Reeves, W. J. (1980). *Librarians as Professionals; The Occupation's Impact on Library Work Arrangements*. Lexington, Mass.: Lexington Books.

Reith, D. (1984). "The Library as a Social Agency." In A. R. Roger and K. McChesney, *The Library in Society*. op.cit., pp. 5-16.

Richardson, E. C. (1927). "The Philosophy of Librarianship." *Library Journal*, 700-701.

Richardson, E. C. (October,1927). "The Book and the Person Who Knows the Book." *ALA Bulletin*, 21, 289-295. (Also reprinted in B. McCrimmon, American Library Philosophy, 1975, op.cit., pp.51-62.

Richardson, E. C. (1963). *The Beginnings of Libraries*. Hamden, Conn.: Archon Books.

Ricoeur, P. (1981). *Hermeneutics and the Human Sciences; Essays on Language, Action and Interpretation*. Cambridge: Cambridge University Press.

Robson, A. (July 1976). "The Intellectual Background of the Public Library Movement in Britain. *The Journal of Library History*, 11(3), 187-205.

Roden, C. B. (November 1923). "On a Certain Retincence or Inarticulateness among Librarians." *Public Libraries*, 28(9), 489-494.

Rogers, A. R. (1984). "An Introduction to Philosophies of Librarianship." In A. R. Rogers, and K. McChesney, *The Library in Society*, op.cit., pp. 17-32.

Rogers, A. R., and Kathryn McChesney (1984). *The Library in Society*. Littleton, Colo.: Libraries Unlimted. (With the assistance of F.L.Carroll, W.V.Jackson, E.E.Kaungamno, A.Khurshid, D.Reith and H.A.Whatley).

Rohwer, W. D. (1974). *Understanding Intellectual Development; Three Approaches to Theory and Practice*. Hinsdale, Ill.: The Dryden Press.

Ross, C. S. (Spring 1987). "Metaphors of Reading." *The Journal of Library History*, 22(2), 147-163.

Roszak, T. (1986). *The Cult of Information; The Folklore of Computers and the True Art of Thinking*. New York: Pantheon Books.

Rothstein, S. (January 15,1968). "In Search of Ourselves." *Library Journal*, 93, 156-157.

Rovelstad, M. (October, 1974). "Socialistic Librarianship: Cuius regio eius bibliotheca." *The Journal of Library History*, 9, 318-32.

Rudd, D. (October 1983). "Do We Really Need World III? Information Science With or Without Popper." *Journal of Information Science*, 7(3), 99-105.

Runes, D. D. (1983). *Dictionary of Philosophy*. New York: Philosophical Library.

Russell, B. (1912). *Problems of Philosophy*. London: Oxford University Press.

Russell, B. (1945). *A History of Western Philosophy*. New York: Simon and Schuster.

Ryle, G. (1949). *The Concept of Mind*. London: Hutchinson.

Saksena, S. K. (1950). "The Story of Indian Philosophy." In V. Ferm (ed.), *A History of Philosophical Systems*. op.cit.,pp. 3-18.

Samples, B. (1976). *The Metaphoric Mind; A Celebration of Creative Consciousness*. Reading, Mass.: Addison-Wesley.

Samuelson, K. (1974). "Information Models and Theories - A Synthesizing Approach." In Anthony Debons (editor.), *Information Science; Search for Identity*. op.cit., pp. 47-67.

Santillana, G. d., ed. (1956). *The Age of Adventure; The Renaissance Philosophers*. New York: The New American Library.

Saracevic, T. (1976). "Relevance: A Review of the Literature and a Framework for Thinking on the Notion of Information Science. In M. J. Voigt, & M. H. Harris (Editors.), *Advances in Librarianship*. 6 (pp. 79-138). New York: Academic Press.

Savage, E. A. (1911). *Old English Libraries: The Making, Collection, and Use of Books During the Middle Ages*. London: Methuen.

Savage, E. (November-December 1946). "A Man's Library: Potential and Actual:An Essay in Library Philosophy." *The Library World*, 49, 59-62,77-80.

Sayers, F. C. (1950). "The Belligerent Profession." in B. McCrimmon (ed.), *The American Library Philosophy; An Anthology*. (pp. 132-140). Hamden, Conn.: The Shoe String Press. (Reprinted from Michigan Alumnus for March, 1950).

Sayers, W. C. Berwick (1915). *Canons of Classification*. London: Grafton.

Sayers, W. C. Berwick (1955). *A Manual of Classification for Librarians and Bibliographers*: Andre Deutsch, A Grafton Book. (Third Edition-Revised with some corrections).

Sayers, W. C. Berwick. (1976) "Introduction." In S.R. Ranganathan, *Five Laws of Library Science*. (First edition).

Schlipp, Paul A. (1944) *The Philosophy of Bertrand Russell*. Evanston and Chicago.

Schön, D. A. (1979). "Generative Metaphor: A Perspective on Problem-Setting in Social Policy." In Andrew Ortony (ed.), *Metaphor and Thought*. (pp. 254-283). Cambridge: Cambridge University Press.

Schrader, A. M. (1983). *Toward a Theory of Library and Information Science*. Unpublished doctoral dissertation, Indiana University, Bloomington,Indiana.

Schrader, A. M. (1986). "The Domain of Information Science: Problems in Conceptualization and in Consensus-Building." *Information Services & Use*, 6(5/6), 169-205.

Schreider, Y. A. (1965). "On the Semantic Characteristics of Information." *Information Storage and Retrieval*, 3, 221-233.

Sextus, E. (1935). *Outlines of Pyrrhonism*. London: Heinemann.

Shannon, C. E. (1948). "A Mathematical Theory of Communication." *Bell System Technical Journal*, 27, 379-423.

Shannon, C. E., and W. Weaver (1964). *The Mathematical Theory of Communication*. Urbana, Ill: The University of Illinois Press. (Weaver's essay appeared in a condensed form in Scientific American, July 1949; Shannon's paper is a reprint from the Bell System Technical Journal, July & October, 1948.)

Shaughnessy, T. W. (April 1976). "Theory Building in Librarianship." *The Journal of Library History*, 11, 167-176.

Shaw, R. R. (September 1,1967). "Quo Vadis? An Examination of the Librarian's Role in a Democratic Culture." *Library Journal*, 92(15), 2881-2884.

Shera, J. H. (January 1, 1931). "Handmaidens of the Learned World." *Library Journal*, 56: 21-22.

Shera, J. H. (1949). *Foundations of the Public Library*; The *Origins of the Public Library Movement in New England, 1629-1855*. Chicago: The University of Chicago Press.

Shera, J. H. (April 1952). "Foundations of a Theory of Bibliography." *Library Quarterly*, 22, 125-137.

Shera, J. H. (1957). "Pattern, Structure and Conceptualization in Classification." In *International Study Conference on Classification for Information Retrieval*; *Proceedings of the Conference*. Dorking, England. (pp. 15-27). London: ASLIB.

Shera, J. H. (May 1,1960). "Theory and Technique in Library Education." *Library Journal*, 85, 1736-1739.

Shera, J. H. (June 1961). "Social Epistemology, General Semantics, and Librarianship. *Wilson Library Bulletin*, 35, 767-770.

Shera, J. H. (Fall, 1961). "What is Librarianship?" *Louisiana Library Association Bulletin*, 24, 95-97,117-118. (Also reprinted in B. McCrimmon, The American Library Philosophy, 1975, op.cit., pp.165-171).

Shera, J. H. (1962). "S.R. Ranganathan- One American View." *Pakistan Library Review*, IV(7).

Shera, J. H. (April 1963). "Towards a New Dimension for Library Education." *Bulletin of the American Library Association*, 57, 313-317.

Shera, J.H. (1964). "On the Encouragement of Reading." *Wilson Library Bulletin*, (October, 1964), 39(169, 191).

Shera, J. H. (1965). *Libraries and the Organization of Knowledge*. Hamden,Conn.: Archon Books. (Edited and with an Introduction by D.J.Foskett. Few modifications of the original text made by the editor.)

Shera, J. H. (1966). "Foundations of a Theory of Reference Service." *Reference, Research, and Regionalism*, 13-20.

Shera, J. H. (1968). "An Epistemological Foundation for Library Science." In E. B. Montgomery (Editor.), *The Foundations of Access to Knowledge*. (pp. 7-25). Syracuse, N.Y.: The School of Library Science, Syracuse University.

Shera, J. H. (1972). *The Foundations of Education for Librarianship*. New York: John Wiley.

Shera, J. H. (1973). "The Aims and Objects of Graduate Library Education." In Harold Borko (ed.), *Targets for Research in Library Education*. (pp. 9-30). Chicago: American Library Association.

Shera, J. H. (1973). "Towards a Theory of Librarianship and Information Science." In J. H. Shera, *Knowing Books and Men, Knowing Computers Too*. (pp. 93-110). Littleton, Colo: Libraries Unlimited.

Shera, Jesse H. (1976). *Introduction to Library Science: Basic Elements of Library Service*. Littleton, Colorado. Libraries Unlimited, Inc.

Shera, J.H.(1986). "Librarianship, Philosophy of." In *ALA World Encyclopedia of Library and Information Services*. 2d ed. (pp. 453-57). Chicago: American Library Association.

Sheridan, J. (Fall 1986). "Andragogy: A New Concept for Academic Librarians." *Research Strategies*, 4(4), 156-167.

Sherman, C. E. (1939). "The Definition of Library Objectives." In *Current Issues in Library Administration*. Chicago. (pp. 22-46). Chicago: University of Chicago Press.

Shores, L. (1971). "A Philosophy of Librarianship." *Library and Information Science* (Mita Society for Library and Information Science, Keio University, Tokyo), (9), 40-48. (Also reprinted in B. McCrimmon, American Library Philosophy,1975, op.cit., pp.211-228).

Skinner, B. F. (1953). *Science and Human Behavior*. New York: Macmillan.

Smalley, T. N., and Plum, S. H. (1982). "Teaching Library Researching in the Humanities and the Sciences: A Contextual Approach." In C. Oberman, and K. Strauch (Editors.), *Theories of Bibliographic Education*. (pp. 135-170). New York: R.R.Bowker.

Smart, N. (1967). "Indian Philosophy." *The Encyclopedia of Philosophy*, op.cit., 4, 155-169.

Smart, N. (1967). "Zoroastrianism." *The Encyclopedia of Philosophy*, 8, 380-382.

Smith, J. M. (1968). *A Chronology of Librarianship*. Metuchen, N.J.: The Scarecrow Press.

Snyderwine, L. T. (Summer 1981). "The Philosophy of Recording Knowledge." *Journal of Educational Media Science*, 18(4), 27-35.

Sosa Jorge F., and M. H. Harris. (1991). "Jose Ortega y Gasset and the Role of the Librarian in Post-Industrial America." *Libri*, 41(1), 3-21.

Spencer, H. (1862, 6th ed. reissued 1937). *First Principles*. London.

Staveley, R. (1964). *Personal Viewpoints*. London: University College. (University of London School of Librarianship and Archives Occasional publications no.13).

Stevens, N. D. (1986). *The History of Information*. In Wesley Simonton, (ed.) Advances in Librarianship, v.14 (pp. 1-48). Orlando: Academic Press.

Stieg, M. F. (1992). *Change and Challenge in Library and Information Science Education*. Chicago: American Library Association.

Sticht, Tomas G. (1979). "Educational Uses of Metaphor." In Andrew Ortony (ed.), *Metaphor and Thought*. (pp. 474-485). Cambridge, England: Cambridge University Press.

Stonier, T. (1991). "Towards a New Theory of Information." *Journal of Information Science*, 17, 257-263.

Storer, N. and Talcott Parsons (1968). "The Disciplines as a Differentiating Force." In E. B. Montgomery (Editor.), *The Foundations of Access to Knowledge*. (pp. 101-121). Syracuse, N.Y.: The School of Library Science.

Stueart, R. D., and Barbara B. Moran (1987). *Library Management*. Littleton, Colorado: Libraries Unlimited. (Third Edition).

Swanson, Don R. (1964) "The Intellectual Foundations of Library Education: Introduction." *The Library Quarterly*, 34(4):289-293.

Swanson, D. R. (1965). "Introduction." In D. R. Swanson (ed.), *Intellectual Foundations of Library Education.* (pp. 1-6). Chicago: University of Chicago Press. Also in Librry Quarterly, 34 (October, 1964).

Swanson, Don R. (1977). "Information Retrieval as a Trial-and-Error Process." *Library Quarterly*, 47(2):128-148.

Swanson, Don R. (1979) "Libraries and the Growth of Knowledge." *Library Quarterly*, 49 (Januaray 1979):3-29.

Swanson, Don R. (1986). "Undiscovered Public Knowledge." *Library Quarterly*, 56(2): 103-118).

Swigger, Keith. (1985). "Questions in Library and Information Science." *Library and Information Science Research*, 7(1985),369-83.

Tague, J. (June 1979). "Information Science in Graduate Library Programs." *Canadian Library Journal*, 36(3), 89-99.

Taraporewala, I. J. S. (1950). "Zoroastrian Philosophy." In *A History of Philosophical Systems*, op.cit., 19-32.

Taube, M. (1961). "Documentation, Information Retrieval, and Other New Techniques. In Lester Asheim (ed.), *Persistent Issues in American Librarianship.* (pp. 90-103). Chicago: University of Chicago Press.

Taylor, F. W. (1941). *Principles of Scientific Management.* New York: Harper and Brothers Publishers.

Taylor, F. W. (1947). *Scientific Management.* New York: Harper & Row.

Taylor, R. S. (1986). *Value-Added Processes in Information Systems.* Norwood, NJ: Ablex Publishing Corporation.

Taylor, R.S. (1991) "Information Use Environment". In: *Progress in Communication Sciences.* Brenda Dervin and Melvin J. Voight eds. Ablex Publication Corporation.

Temple, P. (November, 1949). "Library Responsibility." *Catholic Library World*, XXI, 35-38.

Terbille, C. I. (Summer, 1992). "Competing Models of Library Science: Waples-Berelson and Butler." *Libraries & Culture_*, 27(3), 296-319.

Thompson, C. S. (July 1931). "Do We Want a Library Science?" *Library Journal*, 56, 581-587.

Thompson, C. S. (1952). *Evolution of the American Public Library, 1653-1876*. Washington, D.C.: Scarecrow Press.

Thompson, J. (1974). *Library Power; A New Philosophy of Librarianship*. Hamden,Conn.: Linnet Books.

Thompson, J. (1977). *A History of the Principles of Librarianship*. London: Clive Bingley.

Traue, J. E. (September, 1990). "Five Thousand Years of the Information Society." *New Zealand Libraries*, 46(6), 17-18.

Trenner, L. (1987). "How to Win Friends and Influence People: Definitions of User-Friendliness in Interactive Computer Systems." *Journal of Information Science*, 13(2), 99-107.

Urban, Wilbur M. (1961) *Language and Reality*. New York: MacMillan

U.S. Office of Education (1956). *The State and Publicly Supported Libraries; Structure and Control at the State Level*. Washington, D.C.: U.S. Government Printing Office.

Uchenko, A. P. (1929). "The Logic of Events; An Introduction to a Philosophy of Time." In G. P. Adams at al (Eds.), *University of California Publications in Philosophy*. 12 (pp. 1-145). New York: Johnson Reprint Corporation, 1969.

Vagianos, L. (January 15,1972). "Information Science: A House Built on Sand." *Library Journal*, 97(2), 153-157.

Vinken, P. (August 1982). "Information Economy, Government and Society." *Aslib Proceedings*, 34(8), 329-349.

Vleeschauwer de, H. J. de. (1955). "Encyclopaedia of Library History." *Mousaion*, 2-3, 44, 46-95.

Vleeschauwer de, H.J. (1966) "Comparative Literature for Librarians." *Mousaion*, no.93-96.

Vleeschauwer de, H. J. (1978). "The Phenomenology of the Contemporary Library." In D. Gerard (Editor.), *Libraries in Society*. (pp. 58-69). London: Clive Bingley.

Walker, Donald, (Sept., 1981) "The Organization and Use of Information: Contributions of Information Science, Computational Linguistics, and Artificial Intelligence." *Journal of the American Society for Information Science*, 32, p.356.

Ward, D. V. (1987). "Metaphysical Issues in Classification Theory." in *Information: The Transformation of Society*. Proceedings of the 50th Annual Meeting of the American Society for Information Science, Boston, October 1987. Learned Information, Medford,N.J, p. 255.

Warren, H. C. (1934). *Dictionary of Psychology*. New York: Houghton Mifflin Co.

Weaver, W. (1964). "Recent Contributions to the Mathematical Theory of Communication." In Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication*. (pp. 1-28). Urbana, Ill.: The University of Illinois Press.

Weber, M. (1947). *The Theory of Social and Economic Organizations*. (trans. and ed. by A.M. Henderson and T.Parson.), Oxford: Oxford University Press.

Wehmever, L. B. (1984). *The School Librarians as Educator*. Littletor, Co.: Libraries Unlimited. (2n ed.)

Weingartner, Rudolph H. (1967) "Historical Explanation." In: *The Encyclopedia of Philosophy*, v.4, op.cit.

Wellard, J. H. (December 1934). "A Philosophical Approach to Library Science." *Wilson Bulletin*, 9, 206-207.

Wellard, J. H. (1940). *The Public Library Comes of Age*. London: Grafton.

Wellisch, H. (July 1972). "From Information Science to Informatics: A ~~Terminological~~ Investigation." *Journal of Librarianship*, 4(3), 157-187.

Wersig, Gernot and Urlich Neveling. (1975). "The Phenomena of Interest to Information Science." *Information Science*, 9(4), December 1975, pp. 127-140.

Wersig, G. W. G. (1985). "Information Science Needs a Theory of 'Information Action'." *Social Science Information Studies*, 5, 11-23. (Includes comments by David Ellis, N.Roberts and T.Saracevic).

Wheeler, J. L. (1946). *Progress and Problems in Education for Librarians*. New York: Carnegie Corporation.

White, C. M. (1964). *Bases of Modern Librarianship*. New York: Macmillan.

White, D. A. (Fall 1978). "The Origins of Greek Librarianship: A Philosophical Exploration." *Journal of Library History*, 13(4) 371-387.

White, M. E. (1956). *The Age of Analysis*. New York: The New American Library.

Whitehead, James, Madison (1980). *Logos of Library and Information Science: Apperceptions on the Institutes of Bibematics with Commentaries on the General Humanistic Method and the Common Philosophy*. PhD disertation, Graduate School of Library and Information Science, University of Pittsburgh.

Whittemore, B. J., and Marshall Yovits (1973). "A Generalized Concept for the Analysis of Information." In A. Debons (Editor.), *Information Science Search for Identity*. (pp. 29-32). (Also published in Journal of American Society for Information Science, 24: May-June 1973; 221-231).

Wilden-Hart, M. (1956). "The Librarian-Technician or Bookman." *Library Association Record*, LVIII, 382-387.

Wilkinson, J. (1983). "The Legitimization of Librarianship." *Libri*, 33(1), 37-44.

Wilkinson, M. A. (August 1984). "Three Hypotheses." *Canadian Library Journal*, 41(4), 195-200.

Williamson, C. C. (1923). *Training for Library Service*. New York: Carnegie Corporation.

Williams, R. V., and Martha Jane K., Zachert. (Spring 1986). "Specialization in Library Education: A Review of the Trends and Issues." *Journal of Education for Library and Information Science*, 26(4), 215-232.

Wilson Bulletin. (1936). "Editorial." *Wilson Bulletin*, 10(5), 336-7.

Wilson, I.G., and M.E. Wilson (1963) *Information, Computers, and System Design*. New York: John Wiley.

Wilson Louis R. (1938). *The Geography of Reading*. Chicago: The University of Chicago Press.

Wilson, L. R. (April 1936). "The Next Fifty Years." *Library Journal*, 61, 255-260.

Wilson, P. (April 1979). "Librarians as Teachers: The Study of an Organization Fiction." *Library Quarterly*, 49(2), 146-162.

Wilson, P. (1983). *Second-Hand Knowledge; An Inquiry into Cognitive Authority*. Westport,Conn.: Greenwood Press. (Contributions in Librarianship and Information Science, Number 44).

Wilson, P. (1993). Stieg, M. F. "Change and Challenge in Library and Information Science Education," -Review. *College & Research Libraries*, May 1993, v.54, n.3, pp. 275-276.

Winger, H. (October 1961). "Aspects of Librarianship: A Trace Work of History." *Library Quarterly*, 31, 321-334.

Winter, M. F. (1988). *The Culture and Control of Expertise; Toward a Sociological Understanding of Librarianship*. New York: Greenwood Press. (Contributions in Librarianship and Information Science).

Wooster, Harold (1955) "Perfection," *Wilson Library Bulletin*, 30:158-9.

Wright, H. C. (Spring 1976-a). "The Substance of Librarianship." *Utah Libraries*, 19, 27-33.

Wright, H. C. (October 1976-b). "The Immateriality of Information." *The Journal of Library History, Philosophy and Comparative Librarianship*, xi(4), 297-315.

Wright, H.Curtis. (1977) *The Oral Antecedents of Greek Librarianship*. Provo, Utah: Brigham Young University Press. (Foreword by Jesse H. Shera; Afterword by H.J. de Vleeschauwer).

Wright, H. C. (Summer 1978). "Inquiry in Science and Librarianship." *Journal of Library History*, 13(3), 250-263.

Wright, H. C. (Spring 1979-a). "The Informational Function of the Physical Datum in Human Communications." *Scholar and Educator*, 27-34.

Wright, H. C. (March 1979-b). "The Wrong Way to Go." *Journal of the American Society for Information Science*, 30, 68-76. (Revised in part from a previously published article "Inquiry in Science and Librarianship," *Journal of Library History*, Summer, 1978.)

Wright, H. C. (Spring 1981-a). "An Anthropological Model for Librarianship." *Scholar and Educator*, 31-39.

Wright, H. C. (May 1981-b). "The Instrumentality of Data." *NLA Newsletter*, 3-9. (Revised from "The Informational function of the Physical datum in Human Communication," *Scholar and Educator*, Spring 1979, pp.27-34.

Wright, H. C. (1982) "An Interdisciplinary Philosophy of Librarianship." *Annual Conference of the Society of Educators and Scholars* |Microform|. ERIC ED 227 864.

Wright, H. C. (Spring 1984). "From Chaos to Kaplan: A Saga of Library Literature." *Scholar and Educator*, 8, 11-31.

Wright, H. C. (Spring 1986). "The Symbol and Its Referent: An Issue for Library Education." *Library Trends*, 34, 729-76.

Wright, H. C. (1988). *Jesse Shera, Librarianship, and Information Science*. Provo, Utah: Brigham Young University. (Occasional Research Paper Number 5).

Wurman, R. S. (1989). *Information Anxiety*. New York: Doubleday.

Yngve, V. H. (Winter 1981). "Stoic Influences in Librarianship: A Critique." *The Journal of Library History*, 16(1), 92-105.

Yolton, J. W. (1962). *Thinking and Perceiving*. LaSalle, Illinois: The Open Court. (A Study in the Philosophy of Mind).

Young, P. (1987). *The Nature of Information*. New York: Praeger.

Yovits, M. C. and R.L. Ernst. (1969). "Information Science: Toward the Development of a True Scientific Discipline." *American Documentation*, 20(4), 369-376.